

**2014-1612, -1655**

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**IN THE  
UNITED STATES COURT OF APPEALS  
FOR THE FEDERAL CIRCUIT**

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**PARKERVISION, INC., a Florida Corporation,**

*Plaintiff - Appellant,*

**v.**

**QUALCOMM INCORPORATED, a Delaware Corporation,**

*Defendant - Cross-Appellant,*

**STERNE, KESSLER, GOLDSTEIN & FOX PLLC,**

*Defendant.*

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Appeals from the United States District Court for the Middle District of Florida in case no. 3:11-cv-00719-RBD-JRK, Judge Roy B. Dalton, Jr.

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**CORRECTED NONCONFIDENTIAL BRIEF OF PLAINTIFF-APPELLANT  
PARKERVISION, INC.**

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## **CERTIFICATE OF INTEREST**

Counsel for ParkerVision, Inc., certifies the following (use “None” if applicable; use extra sheets if necessary):

1. The full name of every party or amicus represented by me is:

ParkerVision, Inc.

2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:

None

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

None

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or are expected to appear in this court are:

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### **CONFIDENTIAL MATERIAL DELETED**

Material has been deleted from pages 6-7, 22-24, 29, and 32 of ParkerVision’s nonconfidential brief (including the figures on pages 24 and 32) because the material references, or is based on, portions of the record Qualcomm designated as confidential. The material omitted on these pages concerns details related to the structure of the accused products as well as statements in emails treated as confidential by Qualcomm at trial.

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### **STATEMENT OF RELATED CASES**

No appeal in or from the same civil action was previously before this or any other appellate court. Counsel are not aware of any case that may be directly affected by this Court's decision.



**STATEMENT OF JURISDICTION**

(a) The statutory basis for jurisdiction of the trial court was 28 U.S.C. § 1338(a).

(b) The statutory basis for jurisdiction of this Court is 28 U.S.C. § 1295(a)(1), the district court having issued a final judgment on June 23, 2014.

## **I. STATEMENT OF THE ISSUES**

1. The asserted claims require “generating” a baseband signal using switches and capacitors configured to operate in a specified manner. ParkerVision showed that every accused product contains that specific configuration of switches and capacitors controlled to generate a baseband signal in the same way. Qualcomm did not present a non-infringement expert and the jury found infringement. Nevertheless, the district court granted JMOL of non-infringement because ParkerVision’s expert, referring to a schematic diagram of the circuit showing a wire that is drawn from the switches to an output with the capacitors in the middle, testified that a baseband signal was present at a point on that wire “between” the switches and capacitors. From this, the district court concluded that the capacitors could not have been involved in generating the baseband signal because, according to the schematic, the capacitors are depicted to the right, i.e., “downstream,” of the point where ParkerVision’s expert identified the baseband signal.

Did the district court err in granting JMOL on this basis notwithstanding that:

(1) ParkerVision’s expert testified that the capacitors were essential to generating the baseband signal and that, without them, the baseband signal would not be generated as required by the claims;

(2) circuit schematics are not literal reproductions of the circuit and Qualcomm's own expert testified that where a wire is drawn schematically, every point along it may be treated as being "one and the same point," such that if a baseband signal appears on a wire it should be understood as existing at every point along the wire; and

(3) the patents-in-suit expressly teach that the invention's specific configuration and control of switches and capacitors cause the capacitors to exert significant influence on signals that are depicted in a schematic as appearing "upstream" from them?

2. The asserted claims also require switches that are controlled to "sample" a signal—that is, reduce a continuous-time signal to a discrete-time signal. ParkerVision showed that the accused products contain switches that are controlled to break up a continuous-time carrier signal into a discrete-time signal. This was shown using a representative product having a 25% duty cycle, which means that switches open and close so that a formerly continuous signal would flow for 25% of the time, and would not flow for the other 75% of the time—creating a discrete-time signal. ParkerVision's expert then opined that the other accused products, including a subgroup that Qualcomm referred to as the "50% duty cycle" products, infringed for the same reason.

Notwithstanding this testimony, the district court granted JMOL of non-infringement for the 50% duty cycle products because the district court believed that a product operating precisely at a duty cycle of 50% will not create a discontinuous signal and thus cannot satisfy the “sampling” limitation of the asserted claims.

Was the district court’s grant of JMOL in error where:

(1) ParkerVision’s expert testified that all the accused products meet the sampling limitations for the same reason—they all reduce a continuous-time signal to a discrete-time signal;

(2) there was no evidence before the jury showing that the 50% duty cycle products operated differently than as described by ParkerVision’s expert;

(3) to support its contrary understanding of how the 50% duty cycle products operated, the district court relied on evidence from the summary-judgment record that was neither provided to the jury, nor subject to cross-examination; and

(4) ParkerVision’s expert testified, and Qualcomm’s own documents showed, that even the so-called 50% duty cycle products operate with duty cycles of less than 50%.

## **II. PRELIMINARY STATEMENT**

The jury in this case heard evidence that ParkerVision’s invention was “revolutionary,” that engineers testing it were “very impressed with [its]

performance,” and that it was the “holy grail” the mobile-phone industry had been looking for. Evidence also showed that the patents ParkerVision obtained to protect its technology were so fundamental that it would “be very difficult for anybody to ever use this technique without stepping on one or more of their claims.” This evidence was not the self-serving testimony of an inventor or the paid testimony of an expert. Instead, it came from the contemporaneous internal files of Qualcomm, which had tested prototypes of the invention years earlier, but whose counsel at trial—in the face of these admissions and more—would insist to the jury that this same invention, and the patents that protect it, are worthless. The jury, hearing substantial evidence of Qualcomm’s infringement from ParkerVision but no evidence of non-infringement from Qualcomm, rightly rejected the arguments of Qualcomm’s counsel.

ParkerVision’s patents relate to wireless receivers for communication devices like mobile phones and Wi-Fi routers. ParkerVision’s invention provides an effective, energy-efficient way to extract a low-frequency data signal (a baseband signal) from a high-frequency signal (a carrier signal) used to carry the data signal through the air. ParkerVision’s invention performs this task using an “energy sampler,” which uses less power and outperforms “voltage samplers” prevalent in the prior art. As a result, wireless devices using the invention have greater range, increased reliability, and longer battery life than other devices.

Looking for a partner to develop mobile phones based on the invention, ParkerVision approached Qualcomm, a major provider of chips used in cell phones. Qualcomm immediately recognized the invention's potential. After testing a prototype, a Qualcomm director told his colleagues that ParkerVision had discovered "virtually the holy grail of RF receiver designs." Qualcomm's Director of Engineering reported that "[t]he truth is ParkerVision [has] stumbled on something revolutionary" and that they were "very impressed with [its] performance!" Later, Qualcomm would learn of ParkerVision's efforts to develop a patent portfolio protecting its invention. After reviewing some of ParkerVision's patent applications with patent counsel, Qualcomm's Senior Vice President of Technology reached this conclusion: "Bottom line is, I think it is going to be very difficult for anybody to ever use this technique without stepping on one or more of their claims."

Although Qualcomm's senior managers and directors recognized the invention's "revolutionary" nature, they thought ParkerVision did not. Thus, before meetings with ParkerVision, Qualcomm engineers were instructed not to

[REDACTED]

[REDACTED]

[REDACTED] Instead, Qualcomm's negotiators were ordered to toe the deliberately misleading "party line": tell ParkerVision that although "we saw some

of the positives . . . the results came in below our specs.” Qualcomm’s goal was to make ParkerVision “feel as handicapped as possible to maximize our bargaining position.”

Disturbed by Qualcomm’s negotiation tactics, ParkerVision eventually broke off discussions, but not before Qualcomm offered about [REDACTED] for ParkerVision’s technology, which was still far below the [REDACTED] value that ParkerVision put on the technology at the time.

A few years after the negotiations ended, ParkerVision learned that Qualcomm had released a product suspiciously similar to the invention. ParkerVision obtained a sample and had it reverse engineered. Upon studying the reverse engineering schematics and report, as well as an article published by Qualcomm describing its product, ParkerVision determined that Qualcomm infringed and brought this suit.

At trial, ParkerVision’s lead inventor, David Sorrells, told the jury how he invented the technology when he could not design an adequate wireless receiver using prior-art technology. He also described the basis for ParkerVision’s suspicion that Qualcomm infringed and how ParkerVision finally confirmed it did. Jeff Parker, ParkerVision’s CEO, testified about ParkerVision’s negotiations with Qualcomm and how Qualcomm, after studying ParkerVision’s invention, was willing to offer a substantial amount of money for a license, although at a price less

than ParkerVision was willing to accept. ParkerVision also presented testimony from Dr. Paul Prucnal, a Princeton electrical engineering professor, who explained to the jury how all the accused Qualcomm products infringed each asserted claim.

Qualcomm, on the other hand, apparently believed the jury would not understand the invention or appreciate its significance. It chose to approach trial in the same way it approached negotiations with ParkerVision: disparage the invention and hope the audience is ignorant and stays that way. Qualcomm's only live witness in the liability phase of the trial was its technical expert, Dr. Behzad Razavi, who opined only that the asserted claims were invalid. Qualcomm never called a non-infringement expert. Nor did Qualcomm call any employee to disavow, or at least explain, the internal memoranda and emails praising the invention and discussing the effectiveness of ParkerVision's patenting strategy.

The jury heard ParkerVision's story of the invention, its detailed and unrebutted infringement evidence, along with Qualcomm's defense of anticipation. The jury found that Qualcomm infringed each asserted claim, that each asserted claim was not invalid, and awarded ParkerVision \$172.7 million in damages—a sum well within the range of offers and counter-offers the parties proposed during their licensing negotiations years earlier.

Eight months after the verdict, the district court granted Qualcomm's JMOL of non-infringement, concluding that the accused products lacked two limitations.



The court's reasons for granting JMOL, however, cannot withstand scrutiny. As to one limitation, the court perceived an inconsistency in Dr. Prucnal's testimony, even though there was no inconsistency and Dr. Prucnal was unequivocal in his opinion that the accused products met each limitation of each asserted claim. As to the other limitation, the district court's analysis is limited to a footnote and is based on a non-infringement theory Qualcomm never presented at trial and that hinges on a distinction among accused products that appears nowhere in the trial record. But the law does not permit a judge to substitute its factual findings for the jury's. This is especially true where, as here, the court's factual findings are based on a misunderstanding of the technology involved and on evidence that was never presented. The judgment must be reversed.

### **III. STATEMENT OF THE CASE**

#### **A. The Parties, Their Products, and the Patents-in-Suit**

##### **1. ParkerVision and Its History**

ParkerVision, headquartered in Jacksonville, Florida, was founded in 1989 by Jeff Parker and David Sorrells. A10195; A10208. Messrs. Parker and Sorrells met previously while working at Parker Electronics, which was owned by Mr. Parker and his father. A10201-02; A10208. Mr. Parker, his father, and Mr. Sorrells collaborated on the advanced thermostat controls and patents that enabled Parker Electronics to grow into a \$100 million company that was eventually acquired by

Carrier Air Conditioning. A10204-05; A10558-59. After the sale, Mr. Parker approached Mr. Sorrells and proposed starting a new company, ParkerVision, for a new product that would be called CameraMan. A10206-08.

Mr. Parker conceived of CameraMan when, after his father passed away, he found a cache of old home movies. A10559. After viewing them, he was saddened that his father was always behind the camera and never in the picture. *Id.* Thus, Messrs. Parker and Sorrells designed CameraMan, a radio-controlled video camera that automatically tracks a person holding a device (such as a microphone) that transmits the person's location and other control information to the camera. A10208-10; A10560. Using this technology, the person controlling the camera can also participate in the events being filmed. A10559.

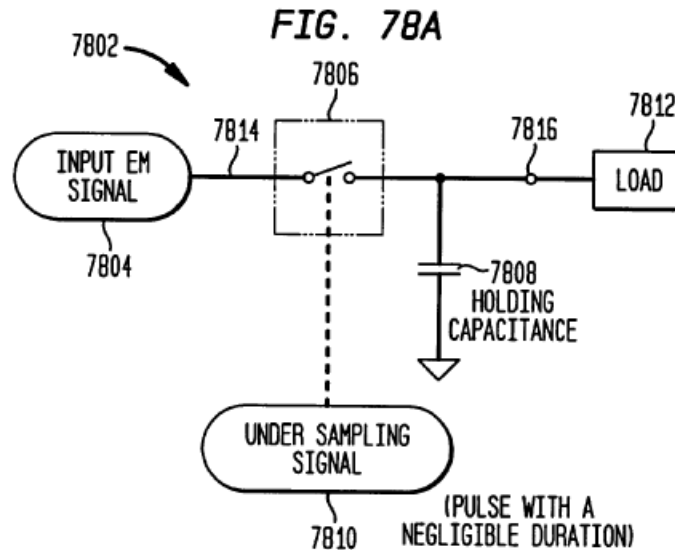
CameraMan was a success. It generated about \$100 million in revenue, was widely adopted, including by ABC World News Tonight and NASA, and won an Emmy award. A10212; A10561. CameraMan originally targeted the professional market and carried a price tag of up to \$10,000; but, consistent with his inspiration for inventing it, Mr. Parker wanted to design a consumer version that would sell for under \$300. A10213; A10562-63. In addition to being less expensive, the consumer model also had to be smaller and consume less power (to run on batteries). A10214. Mr. Parker asked Mr. Sorrells to solve these design challenges, which led to the invention that is the subject of the patents-in-suit. A10563.

## **2. ParkerVision's Invention of Energy Sampling**

Mr. Sorrells soon discovered that the biggest obstacle to the consumer-model CameraMan was its radio receiver. A10214. Radio signals (called “carrier signals”) carry information (called “baseband signals”). A436(1:32-54). A receiver strips out the baseband signals from the carrier signal so that the device to which the receiver is attached can use the baseband signals (e.g., to control the CameraMan). A436(1:55-65).

Existing radio receivers were either too large, too inefficient, or lacked the range needed to make a consumer-model CameraMan feasible. A10214. For instance, the commercial-model CameraMan used a superheterodyne receiver, which performed well but had too many components (making it too large) and used too much power (making battery operation unfeasible). A10215-16. Mr. Sorrells considered using prior-art “direct-conversion” receivers because they were smaller, but their performance was unacceptable. A10267; A10270. The third prior-art receiver technology that Mr. Sorrells investigated was called “voltage sampling.” A10268-69.

A voltage-sampling receiver, sometimes referred to as a “sample-and-hold” circuit, includes a switch and a storage device, such as a capacitor. Figure 78A of the '551 patent illustrates a typical voltage-sampling circuit:



A403; A10380-81.

Mr. Sorrells liked the simplicity, size, and efficiency of the voltage-sampling circuit, but was puzzled by how poorly it performed in down-conversion<sup>1</sup> circuitry. A10272-74. He decided to study and experiment with voltage-sampling circuits to determine why they performed so poorly. *Id.* He began by reading several books on the subject and then building prototypes.<sup>2</sup> A10271-72. In all, Mr. Sorrells and his team created and studied 50 to 100 prototypes. A10223.

Mr. Sorrells soon discovered that a widely held belief underlying most voltage-sampling receivers was wrong. A10272-73. Most voltage-sampling

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<sup>1</sup> The term “down-conversion” is a generic term for extracting a low-frequency signal (such as a baseband signal) from a high-frequency signal (such as a carrier signal).

<sup>2</sup> Mr. Sorrells does not have a four-year college degree and much of what he knows about electrical engineering was self-taught. A10198-200.

devices were designed so that brief snapshots of the carrier wave's voltage were taken from a holding capacitor. *See, e.g.*, A10268; A10273; A10276; A10279. A high impedance<sup>3</sup> load at the output following the holding capacitor ensured that the voltage sampler was efficient in preventing voltage leakage. *See* A467(63:10-20). Such leakage, according to prevailing wisdom, would distort the incoming carrier wave and destroy the baseband carried by it. *See id.* (describing the “negligible effects to the input EM signal” when using a voltage sampler); A10273.

But Mr. Sorrells discovered that “the exact opposite was true.” A10273. Mr. Sorrells experimented with prototypes that held the switch closed for a longer time, so that more energy could be transferred into the capacitor. A10276. The designs also had a low impedance load at the output, so that more energy could be transferred out of the capacitor. *See, e.g.*, A467-68(64:50-65:31); A469(67:31-47). Mr. Sorrells discovered that while the widely held belief that “you greatly distort the carrier signal” was true, these prototypes “pristinely preserved” the baseband on the carrier signal, which was contrary to the prevailing wisdom. A10273. Thus, Mr. Sorrells decided that he would use a switch coupled to a capacitor, just as in voltage sampling, but that he would close the switch for a much longer interval and use capacitors that hold and discharge more energy than capacitors typically used

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<sup>3</sup> Roughly speaking, impedance is the resistance to the flow of energy, current, or power. A10387.

in voltage-sampling devices. A10276-77; A10722; A468-69(66:62-67:30) (explaining the beneficial use of increased capacitances and longer energy-transfer pulse widths). He called his new approach “energy sampling.” A10230.

Mr. Sorrells and his co-workers were surprised by how well energy sampling worked. For instance, they built two wireless receivers which were identical except that one used a conventional voltage sampler, whereas the other used a novel energy sampler. A10230-34. The working range of the voltage-sampling receiver was about ten to twelve feet. A10231-33. The working range of the energy-sampling receiver was about 300 feet. A10234.

ParkerVision realized that its energy sampler would revolutionize wireless receivers, such as those used in modern communications devices like mobile phones and wireless routers. *See* A10236-37; A10248-49; A10252; A10568-70. ParkerVision’s energy sampler outperformed prior art “voltage samplers” and did so using less power. *See* A10279-81. Thus, wireless receivers built using ParkerVision’s energy samplers would have a greater range and a longer battery life than other devices. A10260; A10279-81.

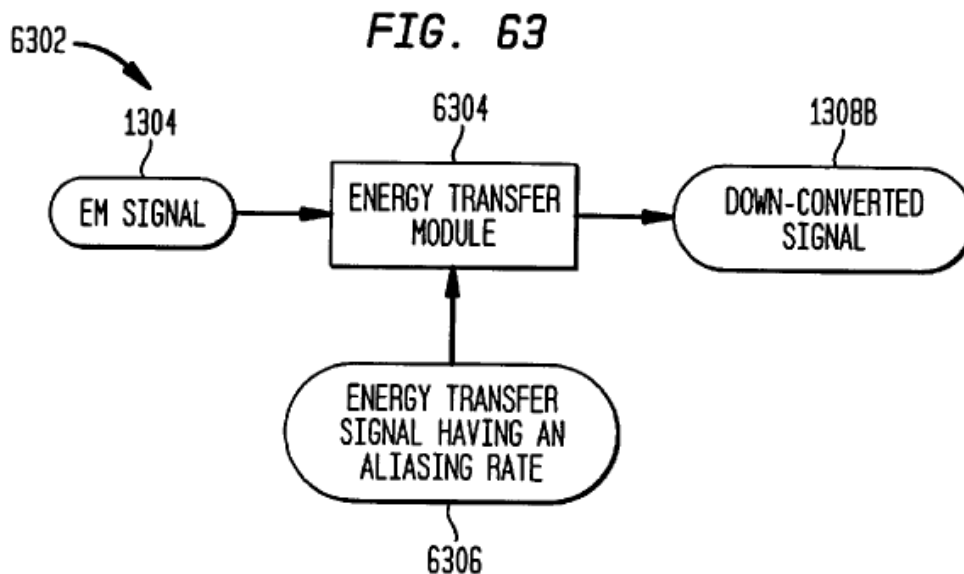
After successfully testing the early energy-sampling prototypes, Mr. Sorrells’s team began implementing the idea into products. One of the earliest uses was for wireless routers. A10330-33. Again, the results of ParkerVision’s energy-sampling technology were surprising: while the wireless routers sold by

ParkerVision's competitors had a range of about 1000-1200 feet, ParkerVision's routers had a range of nearly a mile. *Id.*; A10333-34.

### 3. The Patents-in-Suit

ParkerVision received several patents on Mr. Sorrells's energy sampler, including U.S. Patent Nos. 6,601,551 ("the '551 Patent"), 6,266,518 ("the '518 Patent"), 6,370,371 ("the '371 Patent"), and 7,496,342 ("the '342 Patent"). The patents explain that ParkerVision's energy-sampling inventions down-convert a carrier signal to a baseband signal, but do it with considerably fewer components, reduced power consumption, and an increased signal-to-noise ratio. *See, e.g.*, A448(25:52-26:7).

Figure 63 of the '551 Patent illustrates an exemplary "energy transfer system" (A484 (97:13-29)), i.e., Mr. Sorrells's energy sampler (A10230):

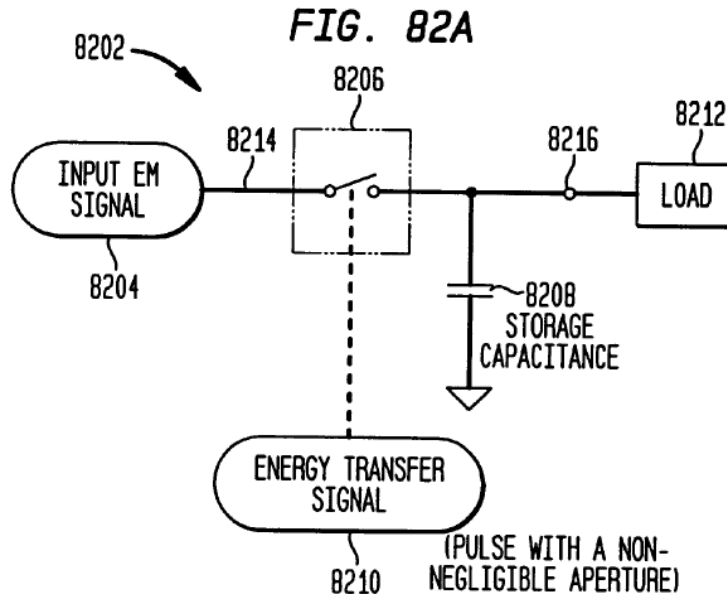


A382.

The energy transfer system **6302** “includes an energy transfer module **6304**, which receives the [electromagnetic] signal **1304** and an energy transfer signal **6306**,” which is a series of electronic pulses that controls the “aliasing” rate at which energy is transferred from the electromagnetic signal. A484(97:12-26). The resulting down-converted signal, e.g., a baseband signal, is made up of energy that has been transferred from the electromagnetic signal. A484(97:22-29); *see also* A10373-74.

Figure 82A (below) is an exemplary circuit-level diagram for the energy transfer system depicted in Figure 63. A468(66:55-59). This embodiment, like the voltage-sampling system of Figure 78A, “includes a switching module **8206** and a storage module illustrated as a storage capacitance **8208**.” *Id.*; A467(63:41-44). But, unlike that voltage-sampling system, the energy transfer signal **8210** in the invention operates the switch so that it is closed for a longer period of time (i.e., it has “a non-negligible aperture”) and the capacitor has a greater capacitance so it stores more energy from the carrier signal. A468-69(66:55-67:13); A467(63:45-57).





A407.

The switch (**8206**) closes to allow energy to pass from the input (**8204**), through the switch and into the storage capacitance (**8208**). A469(67:1-25). The storage capacitance may consist of one or several capacitors. A485(99:66-100:3). When the switch is opened, a significant portion of the energy accumulated in the capacitors discharges into the load circuitry (**8212**) and is output as a down-converted signal, i.e., a baseband signal. A469(67:65-67).

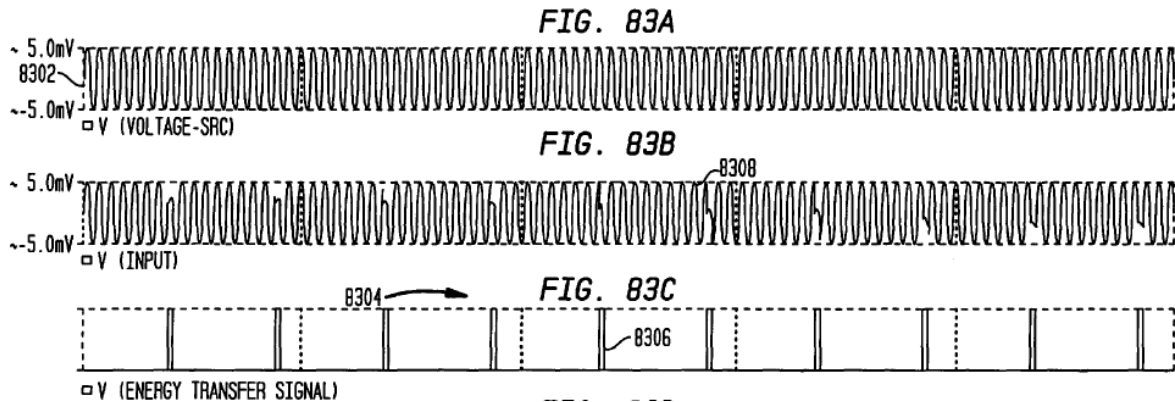
The size of the capacitors and rate at which the energy transfer signal (**8210**) opens and closes the switch ensure that “non-negligible amounts of energy” are stored in the capacitors. A467-68(66:34-67:30). Indeed, the patent shows that when the switch closes for a longer period of time, so much energy from the electromagnetic signal flows into the capacitor that the capacitor’s influence can be

measured in parts of the circuit depicted schematically as appearing “upstream”<sup>4</sup> from it.

For instance, when the switch is closed there is, in effect, an uninterrupted wire that extends from the input, through the switch, across the top of the capacitor, and to the output such that the capacitor influences the electrical properties of the entire circuit and specifically all along that uninterrupted wire. *See* A489(107:1-4) (explaining that “the impedance looking into circuit 8202 is substantially the impedance of . . . the storage capacitance 8208, in parallel with the impedance of the load 8212”). During that time as illustrated in Figs. 83A-C, the closing of the switch causes the capacitor to draw so much energy away from the incoming electromagnetic carrier signal that it distorts the signal on that wire, as observed when measured at point 8214, which is drawn to the left in the diagram, “upstream” from the capacitor. A407 (Fig. 82A).

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<sup>4</sup> There is a frequently used analogy likening electricity passing through a circuit to water flowing through pipes, so it is not uncommon for experts explaining circuitry to laypersons to talk in terms of electrical components or signals existing “upstream” or “downstream” or “before” or “after” each other. *See, e.g.*, A10804; A11056-57; A10947; A11147-48. While the analogy is a useful teaching tool, it must be remembered that analogies go only so far. *See Baskin v. Bogan*, Nos. 14-2386, -2388, 2014 WL 4359059 at \*8 (7th Cir. Sep. 4, 2014) (“The analogy is not perfect (if it were, it would be an identity not an analogy) . . . .”). As just one example, water flows through a pipe at a finite speed, while electricity travels along a wire essentially instantaneously. As will be explained *infra*, treating the analogy to water as a literal description of what occurs in an electrical circuit can lead to substantial confusion.



A408 (illustrating how the energy transfer signals (8306 in Fig. 83C) will cause enough energy to transfer that the incoming electromagnetic signal (Fig. 83A) becomes distorted during the sample period (8308 in Fig. 83B); A469(67:48-64)).

#### 4. The Asserted Claims

The asserted claims recite methods and apparatus for generating a baseband signal from a carrier signal's energy. Claim 82 from the '518 Patent is representative:

82. An apparatus for down-converting a carrier signal to a baseband signal, the carrier signal including at least one of amplitude variations, phase variations, or frequency variations at a frequency lower than a carrier frequency of the carrier signal, the apparatus comprising:

**means for sampling the carrier signal over aperture periods** to transfer energy from the carrier signal at an aliasing rate, the aliasing rate determined according to a frequency of the carrier signal divided by N, wherein N indicates a harmonic or sub-harmonic of the carrier signal;

means for integrating the energy over the aperture periods; and

**means for generating the baseband signal from the integrated energy.**

A702(119:44-59) (disputed terms in bold).

Although the other asserted claims<sup>5</sup> include certain elements in addition to claim 82, they all are directed to down-converting by energy sampling and each includes elements that generally correspond to the “generating” element recited in claim 82. A8-9; A11. And all the claims but one, claim 18 of the ’342 Patent, include elements that generally correspond to the “sampling” element of claim 82. *Id.*; A8 n.9. Although some of the language used for the different elements differs across the various claims, neither party contended that this different language had a material effect on the non-infringement defenses that Qualcomm raised in its post-trial motions. *See id.*; A1324; A1334.

**5. Qualcomm’s Interest in ParkerVision’s Invention**

Recognizing the potentially dramatic advances that the invention offered to mobile-phone technology (A10236-37, A10570-71), ParkerVision contacted Qualcomm in 1998. A10573-77. Qualcomm was interested and invited Mr. Sorrells and Mr. Parker to its lab so that Qualcomm could test ParkerVision’s first prototype chip design. *Id.*; A1005. During these early discussions, Mr. Parker dealt

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<sup>5</sup> The other asserted claims include claims 23, 25, 161, 193, and 202 of the ’551 Patent; claims 27, 90, 91 of the ’518 Patent, claim 2 of the ’371 Patent, and claim 18 of the ’342 Patent. *See* A130-31.

with Jeff Jacobs, the son of Qualcomm's co-founder (A10574-77), and Prashant Kantak (A10576; A1005), a Qualcomm engineer who was then Qualcomm's Director of Corporate Business Development (A1002-04). After learning about ParkerVision's invention, Mr. Kantak described it as "virtually the holy grail of RF receiver designs." A1344. Mr. Kantak then toured ParkerVision's facilities (A10579-80) and sent Mr. Parker an enthusiastic email in which he "underscore[d] the importance of moving [their] business agreement forward" and even gave Mr. Parker his home phone number. A1345; A10581.

In February 1999, ParkerVision delivered its second-generation prototype to Qualcomm. A10582-83. Steve Ciccarelli, a Qualcomm engineer, tested the device and indicated to Mr. Parker and Mr. Sorrells that he was very impressed with its performance. A10583-84; A10587-88. Saed Younis, Qualcomm's Director of Engineering, also reported internally that "We are very impressed with the performance! We can make a phone with [ParkerVision's] parts with higher dynamic range than today's phones." A1349; A10315. Mr. Younis also commented that "[t]he truth is ParkerVision [has] stumbled on something revolutionary, but they are in no way able to converge on a full solution without our help." A1349.

Although Qualcomm's engineers were excited about ParkerVision's invention, Mr. Kantak admonished his team to show "no display of 'enthusiasm'":

“Folks, We are not going to reveal to [ParkerVision] any specific results/data or our opinions from our testing so far. Maybe later on down the line, we can throw them some ‘carrots’ to keep them going.” A1346. Mr. Kantak also urged his team to offer ParkerVision only “the party line”: “we saw some of the positives[,] [e]ven though the results came in below our specs.” *Id.*

Qualcomm continued to study ParkerVision’s prototypes to the point that Qualcomm’s engineers believed that they understood ParkerVision’s invention better than ParkerVision. Indeed, Mr. Kantak urged Dr. Charles Wheatley (Qualcomm’s Senior Vice President of Technology): [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

A1348.

As their discussions continued, Qualcomm became aware that ParkerVision was seeking patent protection for its inventions. In May 1999, Dr. Wheatley reviewed ParkerVision’s patent applications with a Qualcomm in-house patent attorney and informed his colleagues that, “Bottom line is, I think it is going to be very difficult for anybody to ever use this technique without stepping on one or more of their claims.” A1351; A10325-28.

Meanwhile, Mr. Parker and Mr. Kantak continued their negotiations. A10595-96. In June 1999, the parties exchanged licensing proposals. The terms of Mr. Parker's offer to Qualcomm would have resulted in an estimated [REDACTED] [REDACTED] in royalties paid to ParkerVision from 2000 to 2005 for an exclusive license, and [REDACTED] for a non-exclusive license. A1148 at ¶ 80. Mr. Kantak's counter-proposal would have resulted in an estimated [REDACTED] in royalties to ParkerVision for an exclusive license. *Id.* at ¶ 81.

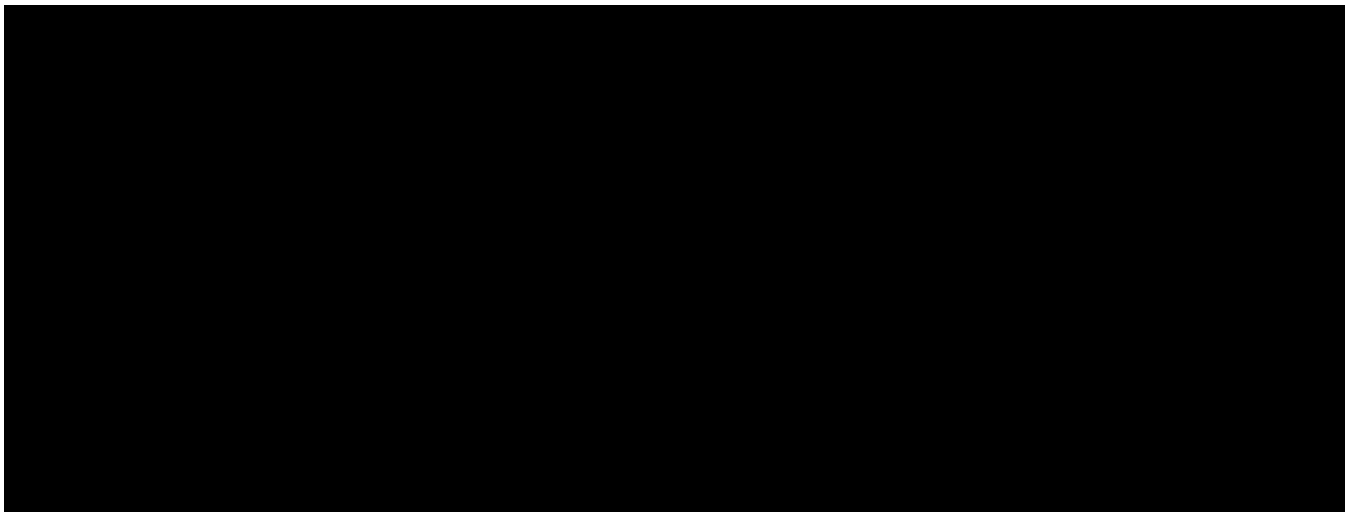
The negotiations ultimately fell apart. Mr. Parker did not like the way Qualcomm negotiated, either from a business perspective or a personal one. A10593-97. For instance, he recalled one meeting where a Qualcomm engineer refused even to shake hands with a ParkerVision employee. A10594. In the end, Mr. Parker testified that he "just didn't believe what they were telling me," so he broke off negotiations. A10600.

A few years after their discussions ended, Mr. Parker and Mr. Sorrells came across a Qualcomm article describing a new product having components and characteristics that were suspiciously similar to ParkerVision's invention. A10341-48. ParkerVision obtained a sample and had it reverse engineered. A10348-50. At trial, Mr. Sorrells explained to the jury how, based on the article and the reverse engineering schematics and report, he was able to determine that Qualcomm infringed. A10350-76.

## **6. Qualcomm's Accused Products**

The accused products are integrated circuits that allow mobile communication products to transmit and receive data. *See* A11069-70. Qualcomm designs the circuits and sells them to companies that make mobile communication devices. *See* A11071-73. The following discussion applies to all of the accused products.

The circuitry used in the accused products to demodulate a baseband from the carrier signal is illustrated in the schematic below:



A1496; A10778.

The carrier signal enters the circuit on the left, goes through the LNA (Low Noise Amplifier) and into the "Passive Mixer" (the two crossed circles). A10780. Like the patented invention, the accused products include switches (located in the Passive Mixers) that are controlled by signals [REDACTED]. [REDACTED]. A10781-82; A10773-76. The accused products also



include several capacitors, some of which are located in the Passive Mixers and others in the Tx Filter. A10773-76; A10799-800; A10804-06.

Again, like the patented invention, the switches are closed long enough to transfer a significant amount of energy from the carrier signal into the capacitors. A10799-800; A11054-56. And when the switches open, the capacitors discharge, releasing the stored energy as a baseband signal, i.e., a “generic information signal desired for transmission and/or reception.” A11053-54; A1039. The amount of time a switch is closed is commonly referred to as its “duty cycle.” For example, a switch controlled by a signal having a 25% duty cycle means that the switch will be closed 25% of the time and open 75% of the time. A10345; A10789.

## **B. The Jury Trial and Verdict**

In October 2013, the parties tried the case before a jury in two phases. The first phase concerned liability (validity and infringement), while the second concerned damages and willfulness. The eight-person jury was highly educated and included an engineer with a master’s degree in electrical engineering, a computer scientist, a commercial litigator, a college nursing instructor, and a teacher. (A10032, A10052-53, A10053-55, A10057, A10067; A10083-84; A10105-07).

During the first phase, the jury heard live testimony from four witnesses: Mr. Sorrells, Mr. Parker, ParkerVision’s technical expert (Dr. Paul Prucnal), and

Qualcomm's technical expert (Dr. Behzad Razavi). A10286; A10545; A10811; A11100; A11376; A11558. Dr. Prucnal opined solely on the issue of infringement, while Dr. Razavi opined solely on the issue of validity. Aside from its invalidity expert, Qualcomm presented no testimony from any of its witnesses, corporate representatives, or even its non-infringement expert (Dr. Robert Fox) during the liability phase of the trial. *See id.*

**1. Dr. Prucnal's Testimony Regarding the Features  
Common to All of Qualcomm's Accused Products**

ParkerVision called Dr. Paul Prucnal, a Professor of Electrical Engineering at Princeton (A10706-07), who mapped claim 82 from the '518 patent onto the accused Magellan product. *See* A10753-808.<sup>6</sup> Dr. Prucnal then mapped each of the other asserted claims to the Magellan product (A10820-75), and explained that the other accused products infringe each asserted claim in the same way as the Magellan product (A10875-76). In forming his opinions, Dr. Prucnal relied upon "the patents, the file[] history of the patents, confidential Qualcomm documents, including Emails, including schematics, other technical documents, design reviews." A10751; A10876.

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<sup>6</sup> ParkerVision's David Sorrells (who had been qualified to testify as an expert) had earlier applied the district court's constructions and explained how Qualcomm's "Solo" product infringed claim 23 of the '551 patent. A10350-75. He used the Qualcomm article that originally triggered ParkerVision's suspicions and a reverse-engineering report to show how each limitation of the claim was met. *Id.*

Although Dr. Prucnal opined regarding each element of each asserted claim, Dr. Prucnal's testimony regarding the "sampling" and "generating" limitations is most relevant to ParkerVision's appeal and is discussed below.

## **2. The Trial Evidence Addressing the "Sampling" Limitations of the Claims**

Dr. Prucnal explained that the recited function in claim 82 is "sampling the carrier signal over aperture periods to transfer energy from the carrier signal." A10770-71; A1040. As noted, the court construed "sampling" to mean "reducing a continuous-time signal to a discrete-time signal." A87. Referring to Figure 82A of the '518 Patent, Dr. Prucnal explained how this function is performed by the corresponding structure: a switch controlled by an "energy transfer signal that controls the switch to open and close." A10771; A1040. When the switch is closed, the continuous-time carrier signal flows through the switch; when the switch is opened, the continuous-time carrier signal does not flow through the switch. *See* A10771-72. This opening-and-closing of the switch samples the continuous-time input signal at a frequency dictated by the frequency of the energy transfer signal. *See id.*

Dr. Prucnal then testified that the claimed "means for sampling" was present in the accused devices by referring to circuit schematics and timing diagrams. *See, e.g.,* A10772; A10777; A10786. Again applying the parties' agreed construction, Dr. Prucnal testified that "the means for sampling consists of a switch and a control

signal that opens and closes the switch.” A10775; A1040. He then identified the switches and control signals in the circuit schematic shown *supra* at page 24 as satisfying the “means for sampling” limitation. A10775-78; A10781. Dr. Prucnal also explained how the aperture period of the control signals functioned to sample the carrier signal and transfer energy from the carrier signal through the switch to storage capacitors located in the Passive Mixers and Tx Filter. A10777-89.

In certain wireless receivers, such as the accused products, there are multiple distinct baseband signals piggy-backing on the carrier signal sent from the transmitter to the receiver. A10790. There is an “in-phase” signal, represented by the path I\_CH in the above diagram; and there is also a “quadrature phase” signal, represented by the path Q\_CH in the above diagram. A10791-92. Each of the I and Q signal paths outputs a plus and a minus signal. A10793-95. Thus, each accused product contains four distinct baseband signal paths (I+, I-, Q+, Q-).

Dr. Prucnal testified that the control signals in the accused Magellan product have a duty cycle of 25%. A10788-89; A1505. Dr. Prucnal illustrated the opening and closing of the switches in a 25% duty cycle product and its effect on current flow. A10790-95. Dr. Prucnal explained that in the 25% duty cycle products, at any given time the current from the carrier signal flows down only one of the four baseband signal paths. *Id.* Specifically, when the top switch (I+) is closed, current flows along only the I+ path. A10793-94. Then, the I+ switch opens and the Q+

switch closes, allowing current to flow along the Q+ path, but none of the others. A10794. The Q+ switch then opens and the I- switch closes, allowing current to flow along only the I- path. *Id.* And finally the I- switch opens and the Q- switch closes, allowing current to flow along only the Q- path. *Id.* This separation of the continuous incoming carrier signal into multiple discrete and discontinuous signals (I+, I-, Q+, Q-), satisfies the sampling limitations. A10794-97; *see also* A11054-56.

Dr. Prucnal then testified that all the accused products infringed in the same way. A10876. Dr. Prucnal testified that he reviewed the schematics and design documents for each accused product, that each circuit was substantially the same as it concerned the asserted patents, and that each accused product infringed for the same reason. *Id.* Dr. Prucnal also explained that, while some accused products may be called 50% duty cycle products (which means each switch is open 50%, instead of 25%, of the time, A10876), none of the accused products operated with a duty cycle of exactly 50%, and that each product is designed to operate with duty cycles less than 50% (A10876-77), [REDACTED]

[REDACTED]

[REDACTED]

Qualcomm never cross-examined Dr. Prucnal regarding the 50% duty cycle products and whether those products satisfy the sampling limitation. Nor did

Qualcomm present any expert testimony or other evidence discussing any differences between the 25% and 50% duty cycle products, let alone why those differences should lead to a verdict of non-infringement. In fact, during the trial neither party even identified which accused products were 50% duty cycle and which were 25% duty cycle. So little attention was paid by either party to any differences among the accused products that neither the litigants nor the court noticed that the jointly submitted verdict form inadvertently listed a non-accused product. A6 n.6.<sup>7</sup>

### **3. The Trial Evidence Addressing the “Generating” Limitations of the Claims**

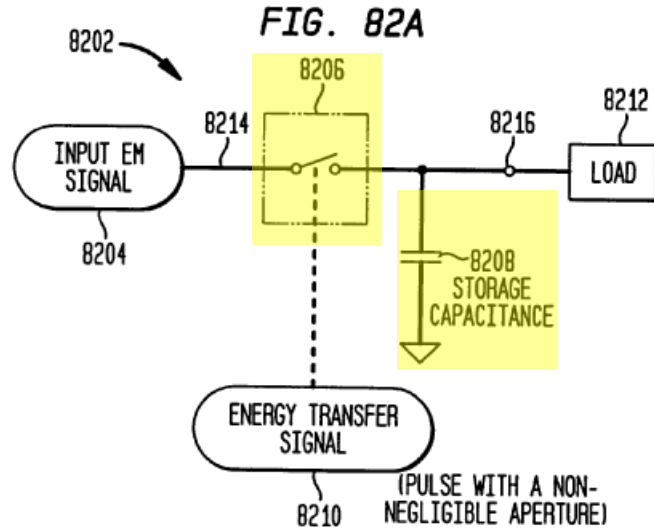
#### **a. Dr. Prucnal’s Direct Testimony**

Dr. Prucnal opined that the accused products satisfied the limitation: “means for generating the baseband signal from the integrated energy.” A10808. The district court defined the function for this means-plus-function term to be “generating the baseband signal from the integrated energy” and the corresponding structure to be “any arrangement of (i) one or more of the switch circuitry controlled by any one of pulse generators and (ii) one or more of the energy storage circuitry disclosed or described in Figure[] . . . 82A . . . or equivalents

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<sup>7</sup> After this oversight, which the court deemed “not consequential,” was discovered, the court issued a corrective instruction to ensure that no damages would be based on the non-accused product. A12283. Also, neither party’s damages expert included the non-accused product in his damages calculation.

thereof.” A127; A10801-02. Dr. Prucnal directed the jury to the switch and storage structures illustrated in Figure 82A of the ’551 Patent:



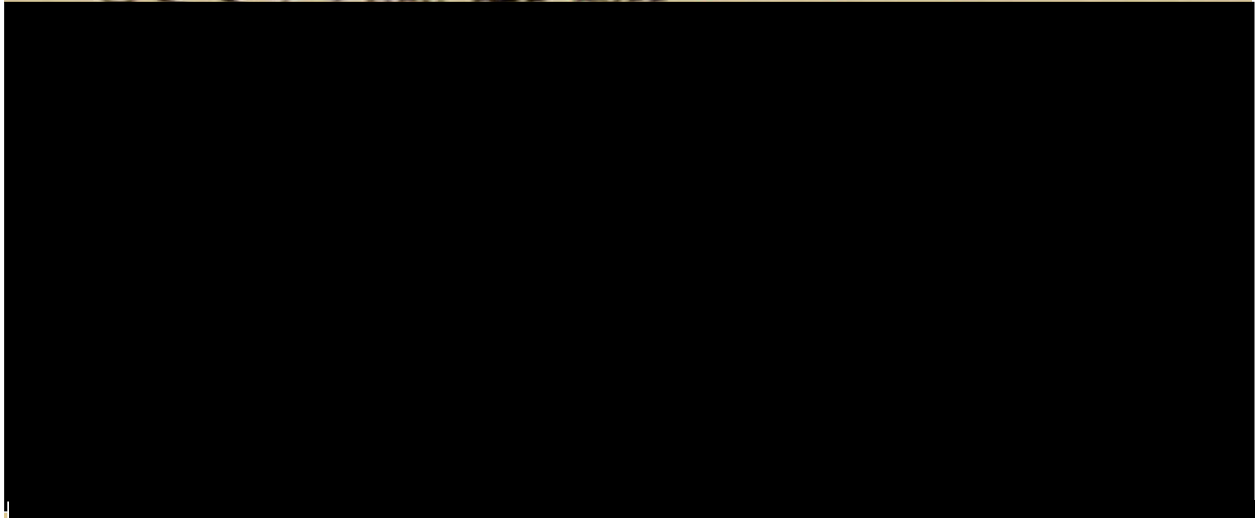
A10802; A407 (highlighting added to show the switch and storage structures). Dr. Prucnal also applied the court’s construction of baseband signal: “any generic information signal desired for transmission and/or reception.” A1039; A10754-55.

Dr. Prucnal explained that in the accused products, the combination of switches (located in the Passive Mixers) and capacitors (located in both the Passive Mixers and Tx Filter) described *supra* at pages 24-25 and 28-30 met the district court’s construction for the structure and recited function for the claimed “generating means.” A10799-804; A1461; A1704.

#### **b. Dr. Prucnal’s Testimony on Cross-Examination**

During cross-examination, Qualcomm’s counsel focused on where, precisely, the baseband signal was present in the accused devices using the

following schematic, which shows the switches and capacitors that are inside the Passive Mixer (A10988):



[REDACTED]

[REDACTED]

[REDACTED]

Qualcomm’s counsel asked several questions apparently intended to get Dr. Prucnal to admit that the capacitors play no role in generating a baseband signal. For instance, Qualcomm’s counsel repeatedly tried—unsuccessfully—to get Dr. Prucnal to agree that any baseband signal would be unchanged if the capacitors were “ripped out.” *See* A11018-20. He also tried—again, unsuccessfully—to get Dr. Prucnal to admit that “the mixer [referring to the switches under “1” above] has generated the baseband signal before reaching what [he] designated or indicated as the capacitor.” A10943.

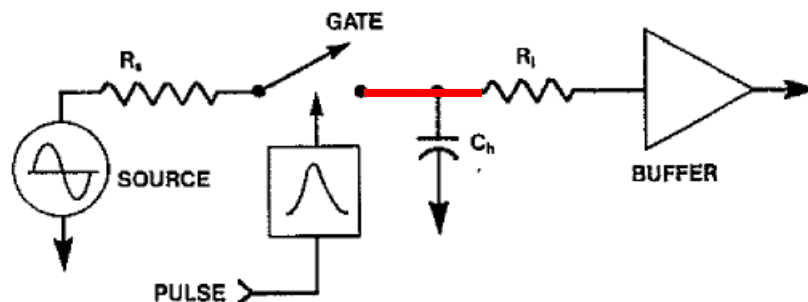


Faced with Dr. Prucnal's insistence that the capacitors are involved in generating a baseband signal (A10943; A11000-01; A11018-22; A11028), Qualcomm's counsel then focused on where a baseband signal was present along the wire connecting the switches and the capacitors. Referring to the schematic above, Qualcomm's counsel asked Dr. Prucnal to confirm that a baseband signal was present at the points labeled BBOP and BBOM, which he did. A10943; A10988; *see also* A10760-61; A10774; A10788-89. But Dr. Prucnal also testified that "the actual baseband signal on the baseband path is created after the capacitor resistor" as well. A10947; *see also* A11056-58 (indicating that the baseband signal also is present "after the capacitor").

Later, Qualcomm's counsel argued to the jury that because the schematic is drawn such that the labels BBOP and BBOM appear to the left of the capacitors, the capacitors cannot be involved in generating a baseband signal. A11490-91. Counsel made this argument even though Dr. Prucnal testified that they were involved (*see supra* pages 30-31) and notwithstanding that the patents themselves explain how the capacitors used in the "means for generating" have an influence on the characteristics of the entire circuit, including signals along the same wire which

may, schematically, appear to be “upstream” of the capacitors (*see supra* pages 17-19).<sup>8</sup>

Qualcomm’s counsel made this argument even though a schematic depiction of a circuit does not mean that the electrical properties of that circuit occur sequentially in a literal reproduction of the circuit’s layout. Indeed, Qualcomm’s own expert confirmed that a wire drawn on a schematic should not be treated as a line consisting of many independent points. Instead, what is shown as a single, uninterrupted wire in a schematic should, in reality, be treated as a single point because any signal appearing on that wire appears instantaneously along its entire length. *See supra* page 18 n.4. Specifically, Qualcomm’s Dr. Razavi testified regarding the following schematic, which depicts a switch/capacitor configuration similar to that shown in Qualcomm’s schematic:




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<sup>8</sup> This principle is illustrated in older homes where the lights may dim momentarily in response to a large appliance, such as an air conditioner, turning on. The current drawn by that appliance is sufficiently large that every light on the same circuit is affected by the voltage drop regardless of its physical location (i.e., “upstream” or “downstream”) relative to the appliance.

A2058 (red highlighting added). In response to a question asking him to identify at which of two points “the baseband signal is generated along the wire” (highlighted in red above), Dr. Razavi testified that: “Those are one and the same point. Even though there’s a wire, the wire is the same point.” A11320. In other words, the same baseband signal appears simultaneously at points shown schematically as before, at, and after the capacitor because they are all points along the same wire.

Qualcomm’s counsel also argued with Dr. Prucnal about the function of the capacitors in the accused devices. Qualcomm’s counsel contended that some of the identified capacitors (those in the Tx Filter) served only one purpose: a low-pass filter. A11011-12. Dr. Prucnal agreed that “[i]f the capacitors in the TX filter are just part of a low-pass filter and not an energy sampler,” there would be no infringement. *Id.* But Dr. Prucnal did not agree with the premise. Instead, he testified that while the capacitors in the Tx Filter function as low-pass filters, they are “also serving the purpose of transferring energy, which is what the patent is about.” A11001.

**c. Dr. Prucnal’s Testimony on Redirect**

On re-direct, Dr. Prucnal explained why the questions presented by Qualcomm’s counsel did not undermine his infringement analysis.

Dr. Prucnal again explained how the switches and the capacitors work in the accused products together to satisfy the claimed “means for generating” limitation.

First, when the switches are closed, energy from the carrier signal flows through the switches to charge the capacitors. A11053, A11057. Then, when the switch opens, the accumulated energy that was transferred into the capacitors is discharged into the low impedance load, thereby generating a signal satisfying the district court's construction of "baseband signal": "any generic information signal desired for transmission and/or reception." A11532; A11053, A11057-58, A11060. Thus, Dr. Prucnal concluded, energy from the carrier signal is "used to generate the baseband signal following the capacitor" as a result of the charging and discharging of the capacitor. A11056-57; *see also* A10947 ("the actual baseband signal on the baseband path is created after the capacitor resistor").

Dr. Prucnal then explained that if either the switches or the capacitors were removed, the accused devices would neither operate in the same manner nor infringe. Specifically, Dr. Prucnal explained, "[t]he switch is very important because it's the switch that completes the circuit and allows energy to flow into the capacitor . . . . creating the charging cycle. And then when the switch opens, that's creating the discharging cycle. And that's how the energy is then transferred from that point." A11057-60. Therefore, "[i]f there were not a switch inside the accused products, there would be no infringement." A11058.

Similarly, with respect to the identified capacitors, Dr. Prucnal identified them as "a necessary part of the energy transfer." A11058. Dr. Prucnal then

explained that, contrary to Qualcomm's implication on cross-examination, the accused devices would not function if the capacitors were simply ripped out. *Id.*

#### **4. The Jury's Verdict of Infringement**

After Dr. Prucnal finished his testimony, ParkerVision rested its case-in-chief. A11073. Both sides lodged Rule 50(a) motions on infringement, among other issues. A11074-75; A11098-99. Qualcomm then presented its technical witness, Dr. Behzad Razavi, who opined that the asserted patents were invalid. After presenting the testimony of Dr. Razavi, its only liability witness, Qualcomm rested its defense. A11391. According to the district court, "[t]he jury was attentive and deliberated for a significant period of time." A30 n.30. The jury found each asserted claim was not invalid and was infringed, both directly and indirectly, by Qualcomm. A130-33.

During the subsequent damages phase, the jury awarded ParkerVision \$172.7 million in damages and found that Qualcomm's infringement was not willful. A134.

#### **C. The district court threw out the jury's verdict, finding no reasonable juror could have found infringement**

Qualcomm's renewed JMOL motion on infringement raised several issues: (1) whether Dr. Prucnal's testimony that the Magellan product was representative of all accused products was sufficient to support the jury's finding that each accused product infringed, (2) whether the accused products met the "sampling"

limitations, and (3) whether the accused products met the “generating” limitations. A1313; A1342; A280.

**1. The district court found that ParkerVision’s use of representative products was permissible**

The district court rejected Qualcomm’s arguments attacking ParkerVision’s reliance on the accused Magellan product as representative of 19 other accused products. A20-23. The district court held that ParkerVision’s focus on a representative product in proving infringement for all products was proper under *TiVo, Inc. v. EchoStar Commc’ns Corp.*, 516 F.3d 1290, 1308 (Fed. Cir. 2008), *Spansion, Inc. v. Int’l Trade Comm’n*, 629 F.3d 1331, 1350-51 (Fed. Cir. 2010), and *Symbol Techs., Inc. v. Opticon, Inc.*, 935 F.2d 1569, 1574-75 (Fed. Cir. 1991).

The district court also found that Dr. Prucnal’s use of the accused Magellan product as “representative” of the other accused products provided the jury with substantial evidence of infringement for the other products. A20-23. Dr. Prucnal opined that he “concluded that the design documents and circuits [of the other accused products] show that the circuits are substantially the same [to Magellan] as they relate to the patents. And they also infringe.” A20; A23. The district court further noted that Qualcomm never cross-examined Dr. Prucnal on his “substantially the same” testimony and only cross-examined him on the Solo and Magellan products. A23 (finding Qualcomm’s defense “suggest[ed] that the

products could be treated en masse for the purposes of determining infringement.”).

**2. The district court found that no reasonable jury could find that the 50% duty cycle products satisfy the sampling limitations of the claims**

The district court began its analysis of Dr. Prucnal’s testimony with a criticism of his decision to not do “any testing of any of the accused products.” A25; *id.* n.20. The court failed to cite any general rule that such testing is required to prove infringement. The court noted that Dr. Prucnal based his infringement opinions principally on Qualcomm’s own documentation about the accused products. *Id.*; *see also supra* pages 26, 29.

Turning to the details of Dr. Prucnal’s infringement analysis, the district court found, as a factual matter, that “the 50% duty cycle products could not be found to infringe because such products are designed to carry a continuous signal” and thus cannot meet the “sampling” limitations of the claims. A26 n.21. The district court reached this conclusion despite Dr. Prucnal’s testimony (which the court had just deemed proper and sufficient at A23) that the Magellan product (a 25% duty cycle product) met the “sampling” limitations because it reduced a continuous-time signal to a discontinuous one and that it was representative of the other accused products. *See supra* pages 28-29, 38-39. Qualcomm never cross-examined him about this testimony. *Id.*

Thus, no trial testimony supported the district court's conclusion concerning the differences between the 25% and 50% duty cycle products, and it cited none. Instead, it relied on Qualcomm's JMOL brief (A26 n.21), which argued that "Qualcomm's 50% duty cycle products always have a signal in both the I and Q paths in the receiver" (A2295). To support this argument, Qualcomm cited only a single figure, entitled "Mixer LO buffer phase noise" (A2334 at Fig. 7-16), from a document that, although admitted, was never discussed at trial by any witness or even counsel. As a result, nobody explained to the jury the significance, if any, of the figure—let alone how it allegedly contradicted Dr. Prucnal.<sup>9</sup>

Although the district court's analysis on this point was limited, the court appeared to have relied on arguments made and facts presented by Qualcomm in its summary judgment motion. A2295. Indeed, the summary judgment briefing appears to be the only part of the record that relates to the district court's factual determination that the 50% duty cycle products do not carry a discontinuous signal. During summary judgment, Qualcomm argued that products having a duty cycle of exactly 50% could not infringe because Dr. Prucnal allegedly admitted that

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<sup>9</sup> When Qualcomm presented its closing arguments to the jury, it never cited any differences between the 25% and 50% duty cycle products for the sampling limitations. Instead, it relied on the mixers that are used in each accused product, relying—like Dr. Prucnal—on the Magellan 25% duty cycle product as representative of all products. A11499-502.



products with an “ideal” 50% duty cycle do not carry a discontinuous signal, and thus cannot meet the “sampling” limitations. *See* A1069-74. The district court denied Qualcomm’s summary judgment motion on this issue because Dr. Prucnal disputed whether Qualcomm’s products operate at an “ideal” 50% duty cycle. A65-67; A67 at n.5.

At trial, however, the jury never heard any testimony or argument regarding any material differences between the 25% and 50% duty cycle products. Indeed, the jury was never even told which products were which. *See supra* pages 29-30 and 38-39. The only testimony the jury heard concerning the 50% duty cycle products was from Dr. Prucnal, who testified that there were no material differences between them and the 25% duty cycle products. He also told the jury what he told the court in his declaration opposing summary judgment: the duty cycles of the 50% duty cycle products “vary to less than 50%.” A10876-77.<sup>10</sup>

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<sup>10</sup> In its JMOL brief, Qualcomm recognized the argument that a duty cycle of less than 50% would necessarily result in a discontinuous-time signal. A2295. Without disputing the technical basis for that argument, Qualcomm insisted that Dr. Prucnal never testified that the 50% duty products operated with a duty cycle lower than 50%. *Id.* But the testimony quoted above occurred during his discussion of the 50% duty cycle products. A10876-77. Additionally, the exhibits cited at page 29, *supra*, confirm that those products operate at duty cycles as low as 30%. A1400; A1461.

**3. The district court found that no reasonable jury could find the accused products satisfy the generating limitations of the claims**

The district court also found that Dr. Prucnal's testimony established that the accused products could not meet the "generating" limitations of the claims because he allegedly conceded that the capacitors he identified do not generate a baseband signal. A26-28. The district court reached this conclusion even though Dr. Prucnal's testimony was unequivocal that energy from the carrier signal is transferred into the identified storage capacitors and that this energy is "used to generate the baseband signal following the capacitor." A11057-58; *see also supra* pages 30-37.

The district court's non-infringement determination was based on its view that the capacitors cannot have been involved in generating a baseband signal given Dr. Prucnal's testimony concerning its location on a schematic. A27-28. The court concluded that because Dr. Prucnal testified that a baseband signal was present on a part of a wire located "before" the capacitors, those capacitors could not have been involved in generating the baseband. A27. The court made this factual determination notwithstanding Dr. Prucnal's express contrary testimony concerning the capacitors' role (*see supra* pages 30-37) and the testimony of Qualcomm's expert establishing that a signal on one part of a wire would be present at every point along it (*see supra* pages 34-35). The court also reached this

conclusion notwithstanding that the patents-in-suit teach that capacitors can influence the entire circuit—including signals that are depicted both “upstream” and “downstream” of the capacitors’ location (*see supra* pages 17-19).

The district court also considered Dr. Prucnal’s agreement with Qualcomm’s counsel that “there is ‘no infringement’ *if* the capacitors in the TX filter ‘are used for TX filtering and not for energy sampling’” to be a “concession[.]” fatal to ParkerVision’s case. A28 (emphasis added). The district court accurately quoted Dr. Prucnal, but ignored the conditional nature of the question and Dr. Prucnal’s express rejection of its conditional premise. As noted *supra*, Dr. Prucnal testified that the capacitors in the Tx Filter are not used *only* for TX filtering but are *also* used to generate the baseband. *See supra* page 35 (citing A11001).

The district court also criticized ParkerVision for allegedly raising a “new infringement theory” at the JMOL hearing in which “more than one ‘baseband signal . . .’ might be created in the Qualcomm products” (A27-28) even though ParkerVision’s counsel was simply responding to a hypothetical posed by the court. In the court’s hypothetical, which was based on *Qualcomm’s* non-infringement argument, there were two separate baseband signals, one created “before” the capacitors without any influence from them and another one created “after” the capacitors with their involvement. A13199-201. ParkerVision’s counsel explained to the court that, even accepting this two-baseband-theory as true,

“which we don’t agree with,” there would still be infringement because the “second” signal was generated by energy stored in the capacitors and met the court’s construction of “baseband signal,” i.e., “any generic information signal desired for transmission and/or reception.” *Id.* ParkerVision’s counsel also explained that nothing in the claims required that a baseband signal can be generated only once. A13200-01; *see also* A13193-94. Indeed, it was undisputed that the baseband signal exists long before the carrier signal even reaches the receiver and must be generated multiple times in both analog and digital form, for example, as it travels from a sender’s mobile phone to a recipient’s. A10256-59; A1840; A11300; A13014-17; A13048-50. As Qualcomm’s counsel explained to the jury in his opening statement: “All communications start out as baseband. They get put on the back of a radio, high frequency radio signal. They get sent through space to a tower and back to the phone.” A10175. Nevertheless, the district court flatly rejected the idea that the baseband signal could be generated more than once. A28-29.

**4. The district court, in the alternative, granted a new trial on infringement and also denied ParkerVision’s other post-trial motions as moot**

After holding that the jury’s finding of infringement was not supported by substantial evidence, the district court also alternatively held that a new trial on infringement is required. A31. The district court provided no additional rationale or

justification for its alternative grant of a new trial. *Id.* The district court denied Qualcomm’s Rule 50(b) motions on the issue of validity and denied all other motions, including ParkerVision’s motion for a permanent injunction, as moot. A38; A1225-26 (Dkt. No. 489); A1257-58 (Dkt. No. 490); A1284-85 (Dkt. No. 497). ParkerVision then timely filed its notice of appeal.

#### **IV. SUMMARY OF THE ARGUMENT**

Qualcomm misled the district court into erroneously granting JMOL of non-infringement. Dr. Prucnal’s testimony was clear, consistent, and unequivocal: the accused products meet every element of every asserted claim, including the “sampling” and “generating” limitations. The district court’s decision to disregard this testimony and throw out the jury’s verdict was based on several fundamental errors concerning the technology involved and the evidence that was before the jury.

With regard to the “generating” limitations, the district court believed, based on Qualcomm’s characterization of the circuit schematics, that a capacitor can only generate signals depicted to the right of (or after) a capacitor’s physical location on a schematic. This belief not only lacks support in the record but is demonstrably wrong. Qualcomm’s own expert testified that the same baseband signal will appear at every point along a wire drawn in a schematic because, in reality, all points along that wire—whether “upstream” or “downstream” or “before” or “after”—

should be treated as the same point. And, even if the district court's literal interpretation of the schematic were correct, the patents-in-suit teach that the capacitors of the invention are specifically designed to influence signals that appear throughout the circuit, including signals along the wire connected to the capacitors regardless of whether they are depicted "upstream" of those capacitors on a schematic.

The district court's confusion is confirmed by its insistence that ParkerVision argued that there are two different baseband signals on the same wire, one "before" the capacitors that was not (the court believed) generated by the capacitors, and one "after" the capacitors that was generated by them. As already explained, the signal Dr. Prucnal identified as appearing "before" the capacitors is the same signal that appears "after" them. But even if these *were* two different signals, there would be infringement because the signal appearing "after" the capacitors meets the court's definition of a baseband signal ("any generic signal"). The district court, however, rejected this hypothetical argument based on its erroneous understanding that if a baseband signal was created "before" the capacitors, it could not be created again "after" them. There is nothing in the patents, however, that supports such a restricted understanding of a baseband signal. To the contrary, it was undisputed that a baseband signal has to be

generated multiple times after it is initially generated, not only as it travels across the mobile network from phone to phone, but also within the phones themselves.

The district court also erred in granting JMOL of non-infringement for the so-called 50% duty cycle products. The evidence in the record showed that all the accused products meet the “sampling” limitation for the same reason: they all take an incoming continuous signal and break it into multiple discontinuous signals. The court disagreed with the jury based on the court’s determination that, as a factual matter, a 50% percent duty cycle product will always carry a continuous signal and that this provided a non-infringement defense for Qualcomm. But there was no evidence in the trial record establishing that the 50% duty cycle products carry only continuous signals, nor did anyone from Qualcomm, not even its counsel, explain to the jury why this might have mattered. The only evidence the court could have relied on in reaching its conclusion was from a summary judgment declaration containing testimony that the jury never heard from a witness who never appeared at trial. Because the district court must decide the JMOL motion based only on evidence that was before the jury, it was error to go outside the trial record.

Moreover, even if this evidence had been before the jury, it was disputed by substantial evidence. Dr. Prucnal testified that all of the accused products operate at duty cycles lower than 50%. Accordingly, even assuming that some of the

accused products could theoretically operate with a 50% duty cycle (which, according to the district court meant that they operated with only continuous signals), there was substantial evidence that in practice they did not. As a result, the district court's grant of JMOL was in error.

Finally, the district court's conditional grant of a new trial must also be reversed. This is not a case where the defendant put on overwhelming evidence of non-infringement in opposition to flimsy evidence from the plaintiff. To the contrary, Qualcomm put on no non-infringement evidence and ParkerVision's expert testimony was corroborated by Qualcomm's own documents. Because the district court's new trial order was based on the same misunderstandings of the technology and on non-trial evidence that formed the basis for the district court's erroneous JMOL order, it was an abuse of discretion for the district court to conditionally grant a new trial.

## **V. ARGUMENT**

### **A. Standard of Review**

This Court reviews JMOL decisions under regional-circuit law. *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1301 (Fed. Cir. 2011). In determining whether JMOL was proper, the Eleventh Circuit independently “review[s] all of the evidence in the light most favorable to, and with all reasonable inferences drawn in favor of, the nonmoving party.” *Walker v. NationsBank of Florida N.A.*,



53 F.3d 1548, 1555 (11th Cir. 1995). JMOL for the defendant is appropriate only “when the plaintiff presents no legally sufficient evidentiary basis for a reasonable jury to find for him on a material element of his cause of action.” *Collins v. Marriott Int’l, Inc.*, 749 F.3d 951, 957 (11th Cir. 2014).

This Court also applies regional-circuit law to new-trial decisions. *WMS Gaming, Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1361 (Fed. Cir. 1999). The Eleventh Circuit reviews new-trial orders under an abuse-of-discretion standard, but that review “will be more rigorous when the basis for the motion was the weight of the evidence.” *Williams v. City of Valdosta*, 689 F.2d 964, 974 (11th Cir. 1982). Further, “if the trial court granted the motion for a new trial, review by the appellate court is more stringent.” *Id.* That is because the Eleventh Circuit considers the jury’s fact-finding role to be “sacrosanct.” *See Rabun v. Kimberly-Clark Corp.*, 678 F.2d 1053, 1061 (11th Cir. 1982) (“The trial judge is empowered to invade the sacrosanct arena of the jury by granting a new trial only in the event of an extreme dearth of such credible evidence.”).

#### **B. The District Court’s Grant of JMOL Was in Error**

In granting JMOL, the district court found that all the accused products lacked the “generating” limitations of the claims and the 50% duty cycle products lacked the “sampling” limitations. Although the following analysis focuses on claim 82, it applies to all asserted claims, which stand or fall together for the

purposes of the “generating” limitations. *See supra* page 20. Similarly, the analysis of the “sampling” limitations applies to all claims except claim 18 of the ’342 Patent. *Id.*

Initially, it must be stressed that the district court’s criticism of Dr. Prucnal for not testing the accused products (A25) is misplaced. A patentee may prove infringement by “any method of analysis that is probative of the fact of infringement,” *Forest Labs., Inc. v. Abbott Labs.*, 239 F.3d 1305, 1312 (Fed. Cir. 2001), and circumstantial evidence may be sufficient, *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1318 (Fed. Cir. 2009). There is no “general rule requiring one who alleges infringement of a claim containing functional limitations to perform actual tests or experiments on the accused product or method.” *Martek Biosciences Corp. v. Nutrinova, Inc.*, 579 F.3d 1363, 1374 (Fed. Cir. 2009). Accordingly, it was perfectly appropriate for Dr. Prucnal to base his testimony on Qualcomm’s circuit schematics and technical documents, well-known electrical engineering principles concerning how switches and capacitors work, and computer simulations. *See id.* at 1373-74 (holding that expert testimony based on the accused infringer’s records and “scientific fact” constituted substantial evidence of infringement).

- 1. The district court erred in granting JMOL of non-infringement based on the “generating” limitations**
  - a. Substantial evidence supports the jury’s finding that the accused products satisfy the “generating” limitations**

Under the district court’s construction, the structure for “means for generating” can be simply one or more switches and one or more capacitors that work together to generate a baseband signal—which was defined as “any generic information signal”—from energy stored in the capacitor(s). *See supra* pages 30-31. Dr. Prucnal testified that an identical structure (switches and capacitors) in the accused products generates a baseband signal from the energy stored in the capacitors. *See supra* pages 30-31, 35-37.

Contrary to the district court’s criticism of his testimony as being “notably vague when it came to the generating limitation,” (A27), Dr. Prucnal’s testimony was specific and detailed.<sup>11</sup> He testified that the opening and closing of the switches causes energy from the carrier signal to be transferred into, and then discharged out of, the capacitors in order to generate a baseband signal. *See supra* pages 35-37. This is all that was required to show that the “generating” limitations were met. Accordingly, Dr. Prucnal’s testimony amounted to substantial evidence

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<sup>11</sup> The district court also criticized ParkerVision’s counsel for asking Dr. Prucnal leading questions during direct examination. A24. Although the district court expressed its annoyance with some leading questions, it did not base its JMOL or new-trial orders on this ground. *See* A27-31.

in support of the jury's verdict, and the district court's grant of JMOL was in error. *See Uniloc*, 632 F.3d at 1301 ("This court may not evaluate 'the credibility of witnesses, resolve conflicts in testimony, or evaluate the weight of the evidence,' but must view the evidence in the light most favorable to [the party opposing JMOL]." (citation omitted)).

**b. The district court mistakenly believed that capacitors located "downstream" of the baseband signal could not have been involved in generating it**

In granting JMOL of non-infringement based on the generating limitation, the district court adopted Qualcomm's argument that because the baseband signal appears at a location on a wire drawn in a schematic diagram "upstream" from the capacitors, the capacitors cannot have played any role in generating it. A28-29. This conclusion, however, is contrary to Dr. Prucnal's testimony that the identified capacitors generate a baseband signal and are "necessary," i.e., if they were removed, a baseband signal will not be generated as required by the claims. *See supra* pages 32-33, 35-37.

The district court's understanding that the capacitors cannot have generated the baseband signal Dr. Prucnal identified was based on an erroneous understanding of the schematics that Qualcomm used during cross-examination, which was perhaps exacerbated by a too-literal application of the familiar "water analogy" employed by the experts at trial. *See* page 18 n.4. A circuit schematic is

just a tool that helps designers understand how circuit components interact. It is not to be read literally, a point that Qualcomm's own expert made when he explained that it makes no sense to try to isolate a specific point along a wire drawn in a schematic because all the points along the wire "are one and the same point." A11320. Thus, a baseband signal drawn on a wire to the left ("upstream" or "before") of the capacitors is identical to the baseband signal drawn to the right ("downstream" or "after") of them. The district court's emphasis on where the baseband appears on a drawing of the circuit cannot override Dr. Prucnal's specific testimony concerning how the circuit actually works.

But even reading the schematic literally, the district court's understanding of circuit physics is flawed. The patents-in-suit explain how capacitors can influence signals that appear elsewhere in the circuit, including signals that are drawn "upstream" from them. *See supra* pages 17-19. Indeed, one aspect of the invention is premised on how "downstream" capacitors distort the incoming carrier signal in way that the prior art teaches away from. *See supra* pages 11-14, 17-19.

Because the district court's grant of JMOL on the generating limitations failed to take into account the substantial evidence presented by ParkerVision on the issue and was based on a fundamental misunderstanding of the nature of electronic signals and circuitry, this Court should reverse. *See Uniloc*, 632 F.3d at 1301.

**c. Even if Dr. Prucnal's testimony about the location of the baseband signal were inconsistent with his testimony that the capacitors generate it, resolving this alleged conflict was the jury's responsibility**

As just discussed, there is nothing inconsistent about Dr. Prucnal's testimony concerning the location of the baseband and his testimony that the baseband is created by the capacitors. But even if these two statements were inconsistent, JMOL was improper. That is because only the jury can decide what effects any inconsistencies have on witness credibility. *See Embrex, Inc. v. Serv. Eng'g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000) ("this court will not disturb the jury's credibility determinations or substitute its resolutions of conflicting evidence for those of the jury"); *see also Presidio Components, Inc. v. American Tech. Ceramics Corp.*, 702 F.3d 1351, 1359 (Fed. Cir. 2012) (holding that an expert's testimony, which was "not entirely consistent," nonetheless provided substantial evidence to support the jury's verdict); *Hewitt v. B.F. Goodrich Co.*, 732 F.2d 1554, 1558-59 (11th Cir. 1984) (holding district court abused its discretion in setting aside jury's verdict in favor of plaintiff, even though plaintiff's expert had been impeached and his testimony was "somewhat contradictory").

**d. The district court’s confusion also is evident in its discussion of a hypothetical circuit in which two different basebands exist on the same wire**

The district court’s discussion of what it termed ParkerVision’s “new infringement theory” (*see supra* pages 43-44) confirms that the district court was confused. First, this was not ParkerVision’s infringement theory: ParkerVision’s counsel told the court that “we don’t agree with” it. *Id.* But then ParkerVision’s counsel accepted for the sake of argument that there were two different baseband signals, one generated “before” the capacitors without their involvement and one generated “after” them with their involvement. *Id.* Even in this hypothetical circumstance, explained ParkerVision’s counsel, there would be infringement because at least the “second” signal is generated by the capacitors and it unquestionably meets the court’s definition of a “baseband signal”: “any generic information signal desired for transmission and/or reception.” *Id.*

The district court, however, rejected this contingent argument on the ground that a baseband signal could not be generated more than once. In reaching this conclusion, the district court seems to have misunderstood the nature of a baseband signal. A baseband signal is not “generated” by the claimed energy sampler in the sense the district court apparently understood that term. That is, the district court seems to have understood the baseband signal to be like a tangible article that can be manufactured only once, and from that point on is merely shuttled around from

place to place. Thus, for example, the district court rejected the idea that “more than one ‘baseband signal [or] lower frequency signal’ might be created in the Qualcomm products.” A27.

But a baseband is not a tangible article that can be manufactured just once and only in the receiver. To the contrary, this Court has admonished that “[a] transient electric or electromagnetic transmission” is nothing like an ordinary article of manufacture. *In re Nuijten*, 500 F.3d 1346, 1356 (Fed. Cir. 2007). As the *Nuijten* court explained: “In essence, energy embodying the claimed signal is fleeting and is devoid of any semblance of permanence during transmission.” *Id.* Indeed, it is precisely the fleeting and transitory nature of a baseband signal that makes the district court’s conception of it as something that can be generated only once impossible. Specifically, because a baseband (like any signal) is fleeting and transitory, it *has to be* generated multiple times—sometimes in analog form and sometimes in digital form—from the moment it is originally created in the sender’s mobile phone, to when it is transmitted through the mobile network, to when it is received at the recipient’s mobile phone, where circuitry (including the accused products) continues to generate analog and digital versions of the same baseband signal as it propagates through the phone. *See supra* pages 11, 44.

Therefore, even if two different baseband signals are generated in the accused products, there would still be infringement. *See Stiftung v. Renishaw PLC*,



945 F.2d 1173, 1178-79 (Fed. Cir. 1991) (holding that district court clearly erred in finding non-infringement because it imposed limitations upon a generated signal even though “[w]hat is done with the signal [after it is generated] is simply not limited in any way by claim language”).

**2. The district court erred in granting JMOL of non-infringement for the 50% duty cycle products based on the “sampling” limitations**

**a. Substantial evidence supports the jury’s finding that the accused products satisfy the “sampling” limitations**

Dr. Prucnal’s testimony also provides substantial evidence that the accused products satisfy the “sampling” limitations. Applying the court’s constructions, Dr. Prucnal explained how the accused products perform the recited function of “sampling the carrier signal over aperture periods to transfer energy from the carrier signal” with the same structure described in the patents. *See supra* pages 27-30. Dr. Prucnal referred to circuit schematics for the Magellan product and identified the circuitry in the accused Magellan product corresponding to the claimed switches and control signal and also explained how the aperture period of the control signals functioned to sample the carrier signal, transferring energy from the carrier signal through the switch to the storage capacitors. A10777-89; *see supra* pages 24, 27-30. Dr. Prucnal then explained that he reviewed the schematics and design documents for the other accused products and concluded that each of

the accused products is substantially the same as the accused Magellan product as it relates to the asserted claims and that each also infringes for the same reasons. A10875-76; *see supra* pages 28-30.

Dr. Prucnal's use of the accused Magellan product as a representative product, which was approved by the district court (*see supra* pages 38-39), is supported by this Court's precedent. For example, in *TiVo*, this Court held "there is nothing improper about an expert testifying in detail about a particular device and then stating that the same analysis applies to other allegedly infringing devices that operate similarly, without discussing each type of device in detail." *TiVo*, 516 F.3d at 1308. Here, as in *TiVo*, substantial evidence supports the jury's verdict that each of the accused products infringe the asserted claims. *Id.*; *see also Spansion*, 629 F.3d at 1350-51; *Symbol*, 935 F.2d at 1574-75.

**b. The district court erroneously relied on evidence outside of the trial record**

The district court recognized in denying summary judgment that there was a disputed issue of fact over whether the accused 50% duty cycle products meet the "sampling" limitation. *See supra* pages 40-41. That disputed issue of fact was the result of a disagreement between the experts. On the one hand, Qualcomm's expert opined that a continuous path for the incoming carrier signal always exists in the 50% duty cycle products and that this prevented the "sampling" limitations from being met. On the other hand, ParkerVision's expert provided a declaration stating

that the 50% duty cycle products infringe because they are not “ideal” and so they do not actually operate at a 50% duty cycle. *See id.*

At trial, however, Qualcomm’s expert never testified, so there is nothing in the trial record establishing either (1) that there is always a continuous path for the incoming carrier signal in the 50% duty cycle products or (2) how this prevents the “sampling” limitations from being met. Accordingly, the district court could only have relied on the material submitted by the parties during the summary judgment proceedings to reach its factual conclusion about how the 50% duty cycle products operate. *See supra* pages 39-41. But this material cannot be a proper basis for grant of JMOL. A district court ruling on a JMOL motion is limited to the record that was before the jury. *See, e.g., Embrex*, 216 F.3d at 1347 (“A district court may overturn a jury’s verdict on a motion for JMOL only if, *upon the trial record*, a reasonable jury could not have reached that verdict.”) (emphasis added); *see also McEuin v. Crown Equip. Corp.*, 328 F.3d 1028, 1037 (9th Cir. 2003) (“The jury cannot be said to have reached an erroneous verdict because of evidence that was not before it at trial.”).

Because the district court relied on evidence that was not in the *trial* record, its grant of JMOL on the “sampling” limitations for the 50% duty cycle products must be reversed.

**c. The district court ignored substantial evidence that no accused product operates at a true 50% duty cycle**

Even if the district court could have properly relied on non-trial evidence submitted during the summary judgment stage to support its JMOL order, that order would have to be reversed. That is because, although the evidence from Qualcomm's expert was not before the jury, the evidence that the district court previously found to be sufficient to raise a material factual dispute was. Specifically, the jury heard Dr. Prucnal testify that none of the accused products actually operates with an ideal 50% duty cycle. His testimony was corroborated by Qualcomm's own documents which were admitted into evidence. *See supra* page 29. The district court criticized Dr. Prucnal's testimony on this issue (A26), presumably because he did not explain how a duty cycle of less than 50% negates Qualcomm's non-infringement defense (which, again, was never presented at trial and assumed an ideal 50% cycle). But Dr. Prucnal did testify that there was no material difference between the accused Magellan product (a 25% duty cycle product) and the other accused products (of varying duty cycles). He further opined that each accused product infringes for the same reason as the Magellan product. If Qualcomm had chosen to cross-examine him or put up its own expert on this issue, Dr. Prucnal then would have had reason to explain himself in more detail. It was improper for the district court to criticize Dr. Prucnal when Qualcomm's own

tactical decisions rendered any further explanations unnecessary. *See Symbol*, 935 F.2d at 1574-76 (affirming a finding of infringement where patentee's expert opined on the ultimate issue of infringement and defendant "chose not to expose [plaintiff's expert's] testimony to the glaring light of cross-examination on this issue").

### **C. A New Trial Is Not Warranted**

As discussed previously, although the Eleventh Circuit reviews new-trial orders for an abuse of discretion, it conducts a more rigorous review when, as here, a new trial is ordered on the basis of the weight of the evidence. *See supra* page 49.

This Court should reverse the district court's new-trial order because ParkerVision's evidence of infringement was not substantially outweighed by Qualcomm's evidence of non-infringement. To the contrary, Qualcomm put on no evidence of non-infringement. Instead, the district court's new-trial order is based on the same misunderstanding of the patents and the technology involved as its JMOL order. In other words, there is no "weight-of-the-evidence" problem with the jury's verdict. The district court simply misunderstood the significance of the evidence ParkerVision introduced. *See supra* pages 49-60. Under these circumstances, the contingent new-trial order should be reversed for the same reasons the JMOL order should be reversed. *Hill v. Winn-Dixie Stores, Inc.*, 934 F.2d 1518, 1527 (11th Cir. 1991) ("Our reasons for reversing the judgment

notwithstanding the verdict on the first issue also support our conclusion that the jury verdict regarding coercion and intimidation under the Jury Act was not contrary to the weight of the evidence.”); *see also Uniloc*, 632 F.3d at 1309-10 (reversing the district court’s conditional grant of a new trial where this Court “[was] convinced that the district court’s grant of a new trial on infringement has no more merit than the district court’s grant of JMOL on infringement.”).

Moreover, there is no reason for a new trial on the 50% duty cycle products. The purpose of a new-trial order is to prevent a “miscarriage of justice.” *See, e.g., Lipphardt v. Durango Steakhouse of Brandon, Inc.*, 267 F.3d 1183, 1186 (11th Cir. 2001). Here, it would not be unjust to hold Qualcomm to the consequences of its trial strategy. The only complaint the district court leveled at Dr. Prucnal on this issue was that his testimony at trial was not as detailed as his testimony at summary judgment. But at the summary judgment stage, he had something to shoot at: a factual assertion by Qualcomm’s expert and an explanation of why the expert thought duty-cycle was significant for the “sampling” limitations. If Qualcomm had chosen to put on this evidence or even cross-examined Dr. Prucnal on the topic, Dr. Prucnal could have, and would have, provided a more detailed explanation. There is no injustice in letting the jury verdict stand here. To the contrary, punishing ParkerVision for the trial tactics of Qualcomm’s counsel would be unjust.

**D. On Remand, the District Court Should Consider  
ParkerVision's Post-Trial Motions in the First Instance**

The district court denied all of ParkerVision's post-trial motions on damages and injunctive relief as being moot after granting JMOL of non-infringement. A38. Because the grant of JMOL was in error, the district court also erred in finding those motions moot. As a result, this Court should remand this case to the district court so that it can rule on ParkerVision's motions for supplemental damages, ongoing royalties, post-judgment royalties, and injunctive relief in the first instance. *See Nickson Indus., Inc. v. Rol Mfg. Co.*, 847 F.2d 795, 801 n.3 (Fed. Cir. 1988) (holding that the trial court should determine, in the first instance, whether an injunction is warranted); *Laitram Corp. v. NEC Corp.*, 115 F.3d 947, 954-55 (Fed. Cir. 1997) (holding motions previously denied as moot may be decided by the district court on remand if the appeal made those issues ripe).

**VI. CONCLUSION**

For the foregoing reasons, the district court's grant of JMOL of non-infringement and contingent new-trial order should be reversed. The case should be remanded with instructions to reinstate the jury's verdict and to conduct further proceedings concerning supplemental damages, ongoing royalties, post-judgment royalties, and injunctive relief.

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# **ADDENDUM**

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF FLORIDA  
JACKSONVILLE DIVISION**

**PARKERVISION, INC.,**

**Plaintiff,**

**-vs-**

**Case No. 3:11-cv-719-J-37JRK**

**QUALCOMM INCORPORATED,**

**Defendant.**

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**JUDGMENT IN A CIVIL CASE**

**Decision by Court.** This action came to trial or hearing before the Court. The issues have been tried or heard and a decision has been rendered.

**IT IS ORDERED AND ADJUDGED**

that pursuant to this Court's Order entered on June 20, 2014, judgment is hereby entered in favor of Qualcomm and against Parkervision.

Date: June 23, 2014

SHERYL L. LOESCH, CLERK



By: Patricia Morawski

Copy to:

Counsel of Record  
Unrepresented Parties

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF FLORIDA  
JACKSONVILLE DIVISION**

PARKERVISION, INC.,

Plaintiff,

v.

Case No. 3:11-cv-719-Orl-37TEM

QUALCOMM INCORPORATED,

Defendant.

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**ORDER**

This cause is before the Court on the following:

1. Qualcomm's Renewed Motion for Judgment as a Matter of Law and Motion for New Trial Regarding Invalidity (Doc. 499), filed December 20, 2013;
2. Parkervision's Response in Opposition to Qualcomm's Renewed Motion for Judgment as a Matter of Law and Motion for New Trial Regarding Invalidity (Doc. 516), filed January 24, 2014;
3. Qualcomm's Renewed Motion for Judgment as a Matter of Law and Motion for New Trial Regarding Non-Infringement (Doc. 501 (redacted version)), filed December 20, 2013, and (Doc. 514 (sealed version)), filed January 23, 2014; and
4. Parkervision's Response in Opposition to Qualcomm's Renewed Motion for Judgment as a Matter of Law and Motion for New Trial Regarding Non-Infringement (Doc. 518), filed January 24, 2014.

## BACKGROUND

The complex technology at issue in this patent infringement action concerns methods and devices for down-converting electromagnetic (radio frequency) signals by “energy sampling.” (See Doc. 336-13.) By using the same components previously used to down-convert modulated high frequency signals by “voltage sampling” (switches, capacitors, and resistors), energy sampling down-converts a modulated high frequency signal by altering the size of the capacitor, the duration that the switch is closed, the impedance of the resistors, and the value of the load. (See Doc. 386, pp. 273–78; Doc. 402, pp. 175–77.) Such alterations result in the energy—not the voltage—of the carrier signal being sampled, stored, and used to generate the desired lower frequency signal. (See Doc. 402, pp. 84–85.) Due to the similarity between energy sampling components and voltage sampling components (see U.S. Patent Number 6,061,551, Figs. 78A, 82A), one cannot discern if energy sampling is used in a receiver merely by viewing the layout of the components. (See Doc. 402, pp. 102–05, 113, 119, 121, 126, 152, 161–64, 176, 242; see *also* Doc. 403, pp. 173–74, 228, 232–33, 239–40.) Rather, the use of energy sampling can be discerned only by one skilled in the art who knows “how the switches are operated,” what the input and output impedance is, and the “relative value” of the capacitor to the rest of the circuitry. (See Doc. 402, pp. 102–05; see *also* Doc. 403, pp. 174–82, 228, 232–37, 241–45.)

Employees of Parkervision developed energy sampling in 1996 and 1997 (Doc. 386, pp. 230–39), and Parkervision applied for its first patent related to the technology on October 1, 1998. (PX 1.)<sup>1</sup> On May 9, 2000, the U.S. Patent and

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<sup>1</sup> Citations to PX, DX, and JX followed by a number are to the trial exhibits submitted by Parkervision (PX), by Qualcomm (DX), and jointly (JX). Further, in its

Trademark Office (“USPTO”) issued Patent Number 6,061,551, for a “Method and System for Down-Converting Electromagnetic Signals” (“551 Patent”). (*Id.*) Parkervision continued to submit applications for related patents, and by May 25, 2010, the USPTO had granted Parkervision at least five additional related patents.<sup>2</sup> (See Doc. 158, ¶ 9; see also PX 2 (Patent Number 6,266,518 (“518 Patent”)); PX 3 (Patent Number 6,370,371 (“371 Patent”)); PX 4 (Patent Number 7,496,342 (“342 Patent”)).)

Before any of the patents issued, Parkervision approached Qualcomm in 1998 to license the invention. (See Doc. 336-13, p. 6.) After unsuccessful efforts to reach an agreement in 1998 and 1999, the parties went their separate ways. (*Id.*) More than a decade later, Parkervision initiated this action contending that, in 2006, Qualcomm began directly and indirectly infringing the claims of Parkervision’s patents by using energy sampling in the integrated circuits of various receiver and transceiver products that Qualcomm sold to original equipment manufacturers (“OEM”), who incorporate the products in mobile communication devices (such as smartphones) sold and used in the United States. (See Docs. 1, 158; see also Doc. 336-13, pp. 4–9.) Qualcomm denies that it directly or indirectly infringes Parkervision’s patents and contends that the patents are invalid based on anticipation. (See Doc. 248; Doc. 336-13, pp. 11–12.)

To better understand the complex nature of the technology at issue, the Court held a non-adversarial tutorial on July 24, 2012. (See Doc. 146; see also Docs. 112, 133.) At the tutorial, Parkervision presented the testimony of David Sorrells (a named

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citations to the parties’ briefings, the Court uses the ECF page designations (located at the top left corner of each page of each document). The parties’ page designations (located at the bottom of each page) may differ from the ECF page designations.

<sup>2</sup> During most of the pretrial proceedings, Parkervision claimed that Qualcomm infringed eighty-two claims of these six patents. (See Doc. 158.) Shortly before trial, Parkervision limited the action to eleven claims of four patents. (See Doc. 336-13, p. 4; Doc. 367.)

inventor of the patents and Parkervision's Chief Technology Officer), and Qualcomm presented the testimony of Professor Robert Fox. (Doc. 146.) The witnesses provided the Court with a high-level overview of electronic circuit design and the use of radio frequency signals for wireless communications. (*Id.*) After the tutorial, the Court held a *Markman* hearing. (Docs. 145, 163; see also Docs. 119, 122, 136, 137, 141.) The Court issued its claim construction Order on February 20, 2013. (Doc. 243; see also Docs. 136, 137, 141.) The parties then filed motions for summary judgment regarding validity (Doc. 269, filed by Parkervision), and non-infringement (Doc. 270, filed by Qualcomm). In August 2013, the Court denied the parties' respective motions for summary judgment. (Docs. 318, 320.)

In October 2013, the parties tried the matter before a jury in two phases—the first phase concerned validity and infringement (Docs. 386–88, 391, 393–94, 402–05, 407, 410–11, 413, 438–39), and the second phase concerned damages and willfulness (Docs. 417, 427, 439–44, 446, 470–71).<sup>3</sup> In the first phase, the jury heard live testimony from four witnesses—Mr. Sorrells (Doc. 386, pp. 193–281; Doc. 402, pp. 9–71, 74–138, 141–210, 219–55), Parkervision's President, Jeffrey Parker (Doc. 403, pp. 5–158), Parkervision's retained infringement expert, Dr. Paul Prucnal (*id.* at 160–86, 194–263; Doc. 404, pp. 4–256),<sup>4</sup> and Qualcomm's retained invalidity expert, Dr. Behzad Razavi (Doc. 405, pp. 11–272). While both parties extensively cross-examined each other's witnesses, Parkervision did not present any expert testimony concerning the prior art discussed by Dr. Razavi, and Qualcomm did not present any testimony concerning

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<sup>3</sup> In the second phase of the trial, the jury awarded Parkervision damages of \$172,704,600, but rejected Parkervision's claims of willful infringement. (Doc. 468.)

<sup>4</sup> Parkervision also presented the testimony of Prashant Kantak from his videotaped deposition. (Doc. 403, pp. 158–59.)

infringement or the development and operation of its accused products.<sup>5</sup>

At the conclusion of the first phase of the trial, the jury deliberated for more than ten hours over three days before returning its verdict rejecting Qualcomm's invalidity claims and finding that Qualcomm directly and indirectly infringed: (1) claims 23, 25, 161, 193, and 202 of the '551 Patent; (2) claims 27, 82, 90, and 91 of the '518 Patent; (3) claim 2 of the '371 Patent; and (4) claim 18 of the '342 Patent. (See Doc. 416; see *also* Docs. 407, 410, 413.) Specifically, the jury indicated by checkmarks on the verdict form that the following products infringe Parkervision's asserted patent claims: Astra, Bahama, Eagleray, GZIF3, GZIF4, Halley, Hercules, Iceman, Iris, Libra/Gemini, Magellan, Marimba,<sup>6</sup> Merlin, Napoleon, Odyssey, Ramsis, Solo, Volans, Voltron, and Ywing.<sup>7</sup> (Doc. 416, p. 2.)

Qualcomm timely moved for judgment as a matter of law ("JMOL") concerning invalidity and non-infringement. (Docs. 393, 398, 399, 407, 499, 501, 514.) As to non-infringement, Qualcomm argued that the Court should enter JMOL in its favor because, among other things, the testimony of Dr. Prucnal established that the "generating" and

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<sup>5</sup> Both parties submitted documentary evidence concerning the accused products, including device specifications, user guides, and development documents. (See JX 14–16, JX 44–87, JX 90–93; PX 345–46, PX 483–514, PX 545–48; PX 846–53, DX 500–11.)

<sup>6</sup> Before trial, Parkervision dismissed its claims related to thirty-five Qualcomm products—including "Marimba" die products. (Doc. 367.) Accordingly, the jury was not presented with any evidence upon which it could have decided that Marimba was an infringing product.

<sup>7</sup> In design documents, these architectures are commonly referenced only by their corresponding integrated circuits: RGR6240, WCN2243, FTR8700, RTR6275, RTR6237, RTR6280, RTR6285, RTR6285A, MXU6219, QTR9215, RTR8700, RTR9605, WCN3660, WCN1312, MDM6200, MDM6600, QSC6155, QSC6175, QSC6185, QSC6295, QSC6695, QTR8200, QTR8600, QTR8600L, QTR8601, QTR8615, QTR8615L, RTR8600, RTR8601, RTR8605, QSC1105, QSC1100, QSC1110, WTR1605, WTR1605L, QSC6055, QSC6065, QSC6075, QSC6085, MDM6085, QSC6270, QSC6240, MDM6270, ESC6270, ESC6240, WCN1314, RTR6500, and WCN1320. (Doc. 336-13, pp. 7–8.)

“sampling” limitations are not met in the accused products. (Doc. 514, pp. 12–24.) As to invalidity, Qualcomm contends that JMOL is warranted because three prior art references and the testimony of Dr. Razavi provided unrebutted proof of anticipation, and Parkervision presented no contrary evidence and obtained no relevant admissions from Dr. Razavi on cross-examination. (Doc. 499, pp. 5, 13–16.) Qualcomm further argues that Parkervision’s validity opposition at trial depended on a rejected construction of the “generating” limitations. (*Id.* at 5, 12–14.)

The Court established a post-trial briefing schedule (Docs. 486, 487), and Parkervision filed its responses in accordance with the schedule. (Docs. 516, 518.) After the motions were fully briefed, the Court held a hearing on May 1, 2014, where the parties provided thorough argument concerning their respective positions on Qualcomm’s JMOL motions. (Docs. 536, 537.) As explained below, the Court finds that Qualcomm’s non-infringement motion is due to be granted (or, alternatively, that Qualcomm is entitled to a new trial), and Qualcomm’s invalidity motion is due to be denied.

### **ASSERTED PATENT CLAIMS**

Because the infringement and validity analyses hinge on the language of the patent claims,<sup>8</sup> the text of the asserted claims are set forth in full with brief summaries of the pertinent claim constructions.

#### **I. ‘551 Patent—Method & System for Down-Converting Electromagnetic Signals**

The jury found that all of the accused products infringe claims 23, 25, 161, 193, and 202 of the ‘551 Patent. Claim 23 is an independent apparatus claim, and claims 25,

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<sup>8</sup> See *infra* INFRINGEMENT, Part I, Legal Standards, pp. 17–18.



161, 193, and 202 are also apparatus claims that are each dependent on claim 23. These claims include the generating and sampling limitations that are at issue in the post-trial briefing.<sup>9</sup> Claim 23 covers:

An apparatus for down-converting a carrier signal to a lower frequency signal, comprising:

An energy transfer signal generator;

A switch module controlled by said energy transfer signal generator;

A storage module coupled to said switch module;

Wherein said storage module receives non-negligible amounts of energy transferred from a carrier signal at **an aliasing rate** that is substantially equal to a frequency of the carrier signal plus or minus a frequency of the lower frequency signal divided by  $n$  where  $n$  represents a harmonic or sub-harmonic of the carrier signal, wherein a lower frequency signal is **generated** from the transferred energy.

Claim 25 covers the apparatus of claim 23, “wherein said circuit comprises: an output impedance match circuit coupled to an output of said apparatus.”

Claim 161 covers the apparatus of claim 23, “wherein said storage device comprises a capacitive storage device sized to store substantial amounts of energy relative to energy contained in a percentage of half cycles of a carrier signal, whereby said capacitive storage device integrates the transferred energy.”

Claim 193 covers the apparatus of claim 23, “wherein the aliasing rate is substantially equal to a frequency of the carrier signal divided by  $n$ , and the lower frequency signal is a demodulate [sic] baseband signal.”

Claim 202 covers the apparatus of claim 23:

wherein said storage module receives and integrate [sic] controlled

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<sup>9</sup> Qualcomm argues that the “aliasing rate” limitation is sampling; thus, its sampling arguments apply to the claims of the ‘551 Patent. (Doc. 514.) Parkervision does not dispute this characterization of “aliasing.” (See Doc. 518.)

substantial amounts of energy transferred from the carrier signal over aperture periods wherein said storage module **generates** a lower frequency signal from the integrated energy wherein the transferring of energy substantially prevents accurate voltage reproduction of the carrier signal during the apertures.

## II. '518 Patent—Method & System for Down-Converting Electromagnetic Signals by Sampling and Integrating Over Apertures

The jury found that all of the accused products infringe claims 27, 82, 90, and 91 of the '518 Patent. These claims also include the sampling and the generating limitations.

### A. Claim 27

Claim 27 of the '518 Patent is a method claim dependent on claim 1, which reads:

A method for down-converting a carrier signal to a baseband signal, comprising the steps of:

- (1) Receiving a carrier signal that includes at least one of amplitude variations, phase variations, or frequency variations at a frequency lower than a carrier frequency of the carrier signal;
- (2) **Sampling** the carrier signal over aperture periods to transfer energy from the carrier signal at an aliasing rate, the aliasing rate determined according to a frequency of the carrier signal divided by N, wherein N indicates a harmonic or sub-harmonic of the carrier signal;
- (3) Integrating the energy over aperture periods; and
- (4) **Generating** the baseband signal from the integrated energy.

Claim 27 covers the method of claim 1, "further comprising the step of transferring energy to a load during an off-time."

### B. Claim 82

Claim 82 is an apparatus claim with means-plus-function limitations, which reads:

An apparatus for down-converting a carrier signal to a baseband signal,

the carrier signal including at least one of amplitude variations, phase variations, or frequency variations at a frequency lower than a carrier frequency of the carrier signal, the apparatus comprising:

Means for **sampling** the carrier signal over aperture periods to transfer energy from the carrier signal at an aliasing rate, the aliasing rate determined according to a frequency of the carrier signal divided by N, wherein N indicates a harmonic or sub-harmonic of the carrier signal;

Means for integrating the energy over the aperture periods; and

Means for **generating** the baseband signal from the integrated energy.

### C. Claims 90 & 91

Claims 90 and 91 also are apparatus claims with means-plus-function limitations.

Claim 90 is an independent claim, which reads:

An apparatus for down-converting a first signal to a second signal, comprising:

Means for **sub-sampling** the first signal over aperture periods to transfer energy from the first signal;

Means for integrating the transferred energy over the aperture periods;

Means for **generating** the second signal from the integrated energy; and

Means for impedance matching at least one of said first signal and said second signal.

Claim 91 is dependent on claim 90, and further covers: "The apparatus of claim 90, wherein said aperture periods are substantially greater than zero such that energy transferred is to such an extent that accurate voltage reproduction of the first signal is prevented."

### III. The '371 Patent—Application of Universal Frequency Translation

The jury found that all of the accused products infringe claim 2 of the '371 Patent, which is an apparatus claim covering:

An apparatus, comprising:

At least one universal frequency down-conversion module, including a switch, an integrator coupled to said switch, and a pulse generator coupled to said switch; and

Wherein said pulse generator outputs pulses to said switch at an aliasing rate that is determined according to: (a frequency of a carrier signal +/- a frequency of a lower frequency signal) divided by N;

Wherein said pulses have apertures and cause said switch to close and **sub-sample** the carrier signal over said apertures, and wherein energy is transferred from the carrier signal and integrated using said integrator during said apertures of said pulses, and wherein the lower frequency signal **is generated** from the transferred energy.

#### IV. '342 Patent—Down-Converting Electromagnetic Signals, Including Controlled Discharge of Capacitors

The jury found that all of the accused products infringe claim 18 of the '342 Patent. This claim does not have the sampling limitation, but it does have the generating limitation that is at issue in Qualcomm's non-infringement motion. Claim 18 covers:

A method for down-converting an electromagnetic signal comprising the steps of:

- (1) Receiving an information signal;
- (2) Inverting the information signal to generate an inverted information signal;
- (3) Electrically coupling the information signal to a first capacitor and the inverted information signal to a second capacitor;
- (4) Controlling a charging and discharging cycle of the first and second capacitors **to generate** first and second down-converted information signals across first and second impedance devices, respectively;
- (5) Performing a plurality of charging and discharging cycles of the first and second capacitors **to generate** first and second down-converted information signals across first and second impedance devices respectively;

Wherein the information signal is used to store a charge on the first capacitor when the first switching device is closed and the inverted

information signal is used to store a charge on the second capacitor when the second switching device is closed.

## **V. Claim Constructions**

### **A. Agreed Constructions**

The Court addressed forty-four terms in its *Markman* Order (see Doc. 243),<sup>10</sup> and the parties agreed to the meaning of ten claim terms. (Doc. 141, pp. 12–13.) For instance, the parties agreed that a “baseband signal” (used in claim 193 of the ‘551 Patent) is “any generic information signal desired for transmission and/or reception” (*id.* at 12), and a “carrier signal” (used in all asserted claims of the ‘551 and ‘371 Patents and claims 27 and 82 of the ‘518 Patent) is “an electromagnetic wave that is capable of carrying information via modulation” (*id.*). The parties further agreed that an “aliasing rate” (used in all asserted claims of the ‘551 and ‘371 Patents and claims 27 and 82 of the ‘518 Patent) is a “sampling rate that is less than or equal to twice the frequency of the carrier signal” (*id.*) and that “aperture periods” (used in claim 202 of the ‘551 Patent and all asserted claims of the ‘518 Patent) means “the durations of time over which energy is transferred from the carrier signal.” (*id.*) Finally, the parties agreed that “electrically coupling” (used in claim 18 of the ‘342 Patent) means “indirectly or directly connecting such that an electric signal can flow between the coupled points. (*Id.*)

### **B. Disputed Constructions**

The parties disputed the construction of “lower frequency signal,” terms related to “generating” signals, and “transferring” and “sampling” energy. (Doc. 141, pp. 2–4, 7–8.) The Court construed “lower frequency signal” (used in claim 2 of the ‘371 Patent and all

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<sup>10</sup> Many of the construed terms were from patent claims that Parkervision subsequently dismissed from this action. (See Doc. 243; *supra* note 1.)

asserted claims of the '551 Patent) as "a signal with frequency below the carrier signal frequency." (Doc. 243, p. 16.) Terms related to energy transfer (used in claims 23, 161, 193, and 202 of the '551 Patent, and claims 27, 90, and 91 of the '518 Patent) were construed to require the transfer of energy (i.e., voltage and current over time) "in amounts that are distinguishable from noise." (*Id.* at 13.) The construction of "sampling" and "generating" were disputed in the parties' *Markman* briefings and in dispositive motion briefings.

### 1. Sampling

The Court adopted Qualcomm's proposed construction of the term "sampling" as "reducing a continuous-time signal to a discrete time signal" (Doc. 137, pp. 4–6), and the Court construed "sub-sampling" as a synonym of "under-sample," which means "sampling at an aliasing rate." (Doc. 243, pp. 3–10.) "Sampling" was also discussed in the Court's Order denying Qualcomm's motion for summary judgment of non-infringement of its 50% duty cycle products (Astra, Bahama, Eagleray, GZIF4, Hercules, Iris, Libra/Gemini, Merlin, Ramsis, Volans, Voltron, and Ywing). (Doc. 320, pp. 6–8.) Qualcomm argued that the 50% duty cycle products do not sample because—as Dr. Prucnal conceded—a 50% duty cycle product always charges. (*Id.* at 6–7.) Absent discharge, there is no reduction to a discrete time signal, and there is no sampling. (*Id.*) In response, Parkervision did not dispute that reducing a continuous time signal to a discrete time signal requires discharge; nonetheless, it argued that the Court should deny summary judgment based on testimony from Dr. Prucnal that the absence of discharge would occur only in an "ideal" 50% duty cycle product, and Qualcomm's products are not necessarily ideal. (*Id.* at 7–8 (citing Doc. 277, pp. 12–14.) Rather, the 50% duty cycle products have a discharge opportunity: "[I]t's going to depend upon the

impedance scene looking forward in this circuit where charging the capacitor and then energy is being transferred into it from one or the other of these two . . . ILNA+ or ILNA- but then that has *the opportunity to discharge* as well.” (*Id.* at 7–8 (quoting Dr. Prucnal’s deposition testimony) (emphasis added).) The Court denied Qualcomm’s motion for summary judgment because Parkervision “has put forth sufficient evidence to raise a genuine dispute of material fact regarding the infringement of Qualcomm’s 50% [d]uty [c]ycle [p]roducts.” (*Id.* at 8.)

## 2. Generating

In its *Markman* briefing, Qualcomm argued that the term “generating” was indefinite<sup>11</sup> but that if any construction was possible, it should mean “creating a lower frequency signal from the previously transferred energy.” (Doc. 137, pp. 4–5; see also Doc. 243, pp. 38–39.) Parkervision countered that “generating” need not be construed because it has a plain and ordinary meaning. (Doc. 136, pp. 22–23.) Consistent with Parkervision’s arguments, the Court rejected Qualcomm’s proposed construction, finding that “no construction of these terms is necessary in view of the terms’ use of plain and direct language.”<sup>12</sup> (Doc. 243, pp. 38–40.) The Court again addressed the

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<sup>11</sup> Recently, the U.S. Supreme Court rejected the indefiniteness standard established by the U.S. Court of Appeals for the Federal Circuit. See *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124, 2131 (2014) (holding that indefiniteness standards measured by what is “amenable to construction” or “insolubly ambiguous” are too “amorphous”). The *Nautilus* Court held that the definiteness command of § 112, ¶ 2 requires that “a patent’s claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty.” *Id.* at 2129 (explaining that clarity is mandated even though “absolute precision is unattainable”).

<sup>12</sup> Where “generating” is used in means-plus-function claims (claims 82, 90, and 91 of the ‘518 Patent), the Court held that “means for generating the baseband signal from the integrated energy” is “generating the baseband from the integrated energy,” and the corresponding structure is “any arrangement of (i) one or more of the switch circuitry controlled by any one of pulse generators and (ii) one or more of the energy

generating limitation in its Order denying Parkervision's motion for summary judgment that certain prior art did not anticipate its claims. (See Doc. 318, pp. 3–6.) There, the Court rejected Parkervision's argument that generating the lower frequency signal requires discharge of the transferred energy from a storage device. (See *id.* at 5–6 (noting that “a signal could be ‘generated’ from a charge held in a capacitor . . . indirectly, by measuring the voltage across the capacitor”).)

## STANDARDS

Federal Rule of Civil Procedure 50 provides in relevant part:

(a) **Judgment as a Matter of Law.**

(1) ***In General.*** If a party has been fully heard on an issue during a jury trial and the court finds that a reasonable jury would not have a legally sufficient evidentiary basis to find for the party on that issue, the court may:

- (A) resolve the issue against the party; and
- (B) grant a motion for judgment as a matter of law against the party on a claim or defense that, under the controlling law, can be maintained or defeated only with a favorable finding on that issue.

(b) **Renewing the Motion After Trial; Alternative Motion for a New Trial.** If the court does not grant [a Rule 50(a) motion] . . . the movant may file a renewed motion for judgment as a matter of law and may include an alternative or joint request for a new trial under Rule 59. . . .

(c) **Granting the Renewed Motion; Conditional Ruling on a Motion for a New Trial.**

(1) ***In General.*** If the court grants a renewed motion for judgment as a matter of law, it must also conditionally rule

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storage circuitry disclosed or described in Figures 63, 64A, 64B, 65, 67A, 68G, 69, 74, 76A–E, 77A–C, 82A, 82B, 86, 88, 90, 92, 94A, 95, 101, 110, 111, or equivalents thereof.” (Doc. 243, p. 46.)



on any motion for a new trial by determining whether a new trial should be granted if the judgment is later vacated or reversed. The court must state the grounds for conditionally granting or denying the motion for a new trial.

The U.S. Court of Appeals for the Federal Circuit reviews the grant or denial of a Rule 50 motion under the law of the regional circuit. *i4i Ltd. P'Ship v. Microsoft Corp.*, 598 F.3d 831, 841 (Fed. Cir. 2010). In the U.S. Court of Appeals for the Eleventh Circuit, a district court “should grant judgment as a matter of law when the plaintiff presents no legally sufficient evidentiary basis for a reasonable jury to find for him on a material element of his cause of action.” *Collins v. Marriott Int'l, Inc.*, 749 F.3d 951, 957 (11th Cir. 2014) (citing *Pickett v. Tyson Fresh Meats, Inc.*, 420 F.3d 1272, 1278 (11th Cir. 2005)); see also *Chow v. Chak Yam Chau*, No. 12-15994, 2014 WL 92094, at \*3 (11th Cir. Jan. 10, 2014). The district court must deny a renewed Rule 50 motion where “there exists a ‘substantial conflict in the evidence, such that reasonable and fair-minded persons in the exercise of impartial judgment might reach different conclusions.’” *Davila v. Menendez*, 717 F.3d 1179, 1184 (11th Cir. 2013) (quoting *Christopher v. Florida*, 449 F.3d 1360, 1364 (11th Cir. 2006)); see also *Mee Indus. v. Dow Chem. Co.*, 608 F.3d 1202, 1211 (11th Cir. 2010) (holding that JMOL should be granted if the non-movant does not “provide more than a scintilla of evidence that there is a substantial conflict in evidence to support a jury question”).

After the jury’s verdict, a renewed Rule 50 motion is decided “the same way it would have been decided prior to the jury’s verdict, and . . . the jury’s particular findings are not germane to the legal analysis.” *Chow*, 2014 WL 92094, at \*3 (citing *Chaney v. City of Orlando, Fla.*, 483 F.3d 1221, 1228 (11th Cir. 2007)). “The district court must view the evidence in the light most favorable to the non-moving party and must refrain

from ‘decid[ing] the credibility of witnesses . . . or weigh[ing] the evidence.’” *Davila*, 717 F.3d at 1184 (quoting *Mich. Millers Mut. Ins. Corp. v. Benfield*, 140 F.3d 915, 921 (11th Cir. 1998)). The court may give “‘credence to . . . that evidence supporting the moving party that is uncontradicted and unimpeached, at least to the extent that [it] comes from disinterested witnesses,’ however, [the court must] ‘disregard all evidence favorable to the moving party that the jury is not required to believe.’” *Mee Indus.*, 608 F.3d at 1211 (quoting *Reeves v. Sanderson Plumbing Prods., Inc.*, 530 U.S. 133, 150–51 (2000)).

Federal Rule of Civil Procedure 59 provides that the district court may, “on motion, grant a new trial on all or some of the issues—and to any party— . . . for any reason for which a new trial has heretofore been granted in federal court.” Fed. R. Civ. P. 59(a)(1)(A). The Federal Circuit reviews such motions under regional circuit law. *Commil USA, LLC v. Cisco Sys., Inc.*, 720 F.3d 1361, 1371 (Fed. Cir. 2013). Under Eleventh Circuit law, new trials should not be granted unless “the verdict is against the great—not merely the greater—weight of the evidence.”<sup>13</sup> *Lamonica v. Safe Hurricane Shutters, Inc.*, 711 F.3d 1299, 1312–13 (11th Cir. 2013). The court “may consider the credibility of witnesses and weigh evidence.” *Moxness Prods., Inc. v. Xomed, Inc.*, 891 F.2d 890, 893 (Fed. Cir. 1989); see also *Williams v. City of Valdosta*, 689 F.2d 964, 973 (11th Cir. 1982) (“[T]he trial court is to view not only that evidence favoring the jury verdict but evidence in favor of the moving party as well.”).

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<sup>13</sup> A new trial also may be granted based on an erroneous evidentiary ruling if: (1) the “claim was adequately preserved; (2) the district court abused its discretion in interpreting or applying an evidentiary rule; and (3) [the] error affected a substantial right.” See *Proctor v. Fluor Enters., Inc.*, 494 F.3d 1337, 1349 (11th Cir. 2007) (citations and internal quotation marks omitted). To establish that a substantial right was affected, the moving party “bears the burden of proving that the error probably had a substantial influence on the jury’s verdict.” *Id.* at 1352 (citations and internal quotation marks omitted).

## INFRINGEMENT

### I. Legal Standards

Pursuant to 35 U.S.C. § 271, “whoever without authority makes, uses, offers to sell, or sells any patented invention, within the United States or imports into the United States any patented invention during the term of the patent therefor, infringes the patent.” 35 U.S.C. § 271(a). “Whoever actively induces infringement of a patent [also] shall be liable as an infringer.” *Id.* § 271(b). “A finding of inducement requires both an underlying instance of direct infringement and a requisite showing of intent.”<sup>14</sup> *Fuji Photo Film Co. v. Jazz Photo Corp.*, 394 F.3d 1368, 1377 (Fed. Cir. 2005); see also *Limelight Networks, Inc. v. Akamai Techs., Inc.*, 134 S. Ct. 2111, 2117 (2014).

Direct infringement exists “when the properly construed claim reads on the accused device exactly.” *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 532 (Fed. Cir. 1996). The two-step process of direct infringement analysis requires: first, an interpretation of the claims in dispute; and second, a comparison of the properly construed claims with the accused product. See *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998) (en banc). If a single limitation is missing or is not met as claimed, there is no literal infringement. See *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538–39 (Fed. Cir. 1991).

Interpretation of patent claims is a question of law, but determining whether the accused device satisfies every claim limitation is a question of fact. See *Cook Biotech Inc. v. Acell, Inc.*, 460 F.3d 1365, 1372–73 (Fed. Cir. 2006). The patentee bears the

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<sup>14</sup> The requisite intent requires “knowledge that the induced acts constitute patent infringement.” See *Global-Tech Appliances, Inc. v. SEB S.A.*, 131 S. Ct. 2060, 2068 (2011). “This includes, in part, actual knowledge of the existence of the patent that is infringed.” *SynQor, Inc. v. Artesyn Techs., Inc.*, 709 F.3d 1365, 1379 (Fed. Cir. 2013) (citations and internal quotation marks omitted).

burden of establishing a prima facie showing of infringement as to each accused device by a preponderance of the evidence. See *Medtronic, Inc. v. Mirowski Family Ventures, LLC*, 134 S. Ct. 843, 849–50 (2014) (“It is well established that the burden of proving infringement generally rests upon the patentee.”); see also *Imhaeuser v. Buerk*, 101 U.S. 647, 662 (1879) (“[T]he burden to prove infringement never shifts [to the alleged infringer] if the charge is denied in the plea or answer.”).

## II. Discussion

Qualcomm argues that the Court should enter JMOL in its favor because: (1) “Parkervision failed to present evidence that Magellan is representative” of the remaining accused products (Doc. 514, pp. 25–27); (2) Parkervision failed to present necessary testing to the jury, and the testimony of Dr. Prucnal established that the “generating” and “sampling” limitations are not met in the accused products (*id.* at 12–24; Doc. 537, pp. 50–67); (3) Dr. Prucnal’s testimony concerning other limitations was impermissibly conclusory (Doc. 514, pp. 12–24); and (4) Qualcomm’s “substantial defenses to infringement” require JMOL in its favor on Parkervision’s inducement claims (*id.* at 27–28).

Parkervision counters that Qualcomm’s arguments fail because they are “entirely divorced from the claim language and the claim constructions” (Doc. 537, p. 93) and because “legally sufficient evidence supports the jury’s verdict.” (Doc. 518, p. 5.) Specifically, Parkervision points to the expert testimony of Dr. Prucnal and Mr. Sorrells and “Qualcomm’s own circuit schematics and technical documents” as sufficient evidence to support the jury’s verdict. (See *id.*) Finally, at the May 1 hearing, Parkervision sought to defuse its expert’s fatal admissions by “planting the seed” that “multiple signals” meet the lower frequency construction. (See Doc. 537, pp. 93–94;

see also *id.* at 89–92.)

#### **A. Representative Products**

At trial, nineteen product architectures were accused of incorporating the energy sampling apparatus and methods, and the jury found that all of these products infringed every asserted claim, and it further found that a product called Marimba (which was erroneously included on the verdict form) also infringed. (Doc. 416.) Parkervision presented no evidence concerning Marimba (*supra* note 4), and only very limited expert witness testimony concerning Astra, Bahama, Eagleray, GZIF3, GZIF4, Halley, Hercules, Iceman, Iris, Libra/Gemini, Merlin, Napoleon, Odyssey, Ramsis, Volans, Voltron, and Ywing. With respect to these seventeen products (and Solo, which Mr. Sorrells discussed), Dr. Prucnal offered the following testimony:

How many different accused architectures or products are there in this case? Is it more than one?

Yes.

And in your opinion, is what you're going to show us, does that apply to each of the accused products?

Yes.

(Doc. 403, p. 212.) Dr. Prucnal further stated that his testimony was specific to the Magellan product, but he had “*concluded that the design documents and circuits show that the circuits are substantially the same as they relate to the patents. And they also infringe.*” (Doc. 404, pp. 64–65 (emphasis added).)

Parkervision contends that Dr. Prucnal's conclusory testimony concerning non-Magellan products is sufficient to sustain the jury's verdict because Dr. Prucnal's testimony is unrebutted and consistent with Qualcomm's own consolidated treatment of the products. (Doc. 518, pp. 6–9.) Qualcomm argues that it is entitled to JMOL because

such testimony is not “substantial evidence that the Magellan design is a representative product” for the remaining products.<sup>15</sup> (Doc. 514, pp. 21–23.) Reserving for now the issue of whether the record evidence concerning the Magellan and Solo architecture products was sufficient to establish infringement, the Court first will consider only whether Parkervision’s decision to prove its case with representative products is sufficient grounds for granting JMOL as to the non-Magellan products.

The Federal Circuit has rejected arguments similar to Qualcomm's and permitted a patentee to present evidence concerning one product and "then stat[e] that the same analysis applies to other allegedly infringing devices that operate similarly, without discussing each type of device in detail." *TiVo, Inc. v. EchoStar Commc'ns Corp.*, 516 F.3d 1290, 1308 (Fed. Cir. 2008); see also *Spansion, Inc. v. Int'l Trade Comm'n*, 629 F.3d 1331, 1350–51 (Fed. Cir. 2010) (finding that the patentee's selection of fifty-two representative cases was not "improper burden shifting," but rather that the defendant "simply failed to rebut the substantial evidence set forth" by the patentee).<sup>16</sup>

The Federal Circuit has also explicitly approved proof of patent infringement through the conclusory opinions of a patentee's expert. *Symbol Techs., Inc. v. Opticon*,

<sup>15</sup> Qualcomm raised this issue at trial in relation to its JMOL motion and its objections to Parkervision’s proposed verdict form. (Doc. 411, pp. 6, 58–70, 76–77.) While noting that Dr. Prucnal’s testimony reflected a “50,000 foot” view of the infringement issue, the Court found the testimony sufficient to permit the jury to consider all of the accused products. (*Id.* at 59, 77–78.)

<sup>16</sup> District courts have cited *TiVo* and *Spansion* as authority permitting representative products proof. See *Riverbed Tech., Inc. v. Silver Peak Sys., Inc.*, No. 11-CV-484-RGA-CJB, 2014 WL 266303, at \*4 (D. Del. Jan. 24, 2014) (granting partial summary judgment of infringement based on expert's declaration that he reviewed subsequent versions of a product to confirm that the later versions "contain the same accused functionality" and also infringe); see also *Multimedia Patent Trust v. Apple, Inc.*, No. 10-cv-2618-H KSC, 2012 WL 6863471, at \*13 (S.D. Cal. Nov. 9, 2012) (denying summary judgment of non-infringement based on expert's analysis that product "operate[s] similarly" to infringing product due to use of essentially the same source code).

*Inc.*, 935 F.2d 1569, 1574–75 (Fed. Cir. 1991). In *Symbol*, the Federal Circuit rejected the defendant’s argument that the trial court erred by finding infringement in a non-jury case based on expert testimony “on the ultimate issue of infringement without discussing in detail equivalency between the structures of the accused devices and the structures disclosed in the patent specifications.” *Id.* at 1575. The *Symbol* court noted that “testimony on the ultimate issue of infringement is permissible in patent cases.” *Id.* Indeed, patent cases may be “particularly served” by such method of proof:

[T]he specific purpose behind Rule 705 is to avoid “complex and time consuming” testimony by permitting an expert to “state his opinion and reasons without first specifying the data upon which it is based.” . . . Patent cases, so often typified by lengthy testimony on complex technical issues, are particularly served by this purpose. In short [the patentee] was permitted to rest its prima facie case on [its] expert testimony, including charts, that the patents were infringed, and the District Court was free to accept or reject that evidence.

*Id.* at 1576 (citations omitted). Notably, a patentee who rests its case “on summary testimony” is left exposed to a “profound risk” that the defendant “during its defense or cross-examination” will demonstrate non-infringement. See *id.* at 1575–76 (observing that the defendant has “the responsibility for challenging the factual underpinnings” of ultimate issue testimony).

Here, Parkervision’s representative product litigation strategy appears to be proper under *TiVo*, *Spanion*, and *Symbol*.<sup>17</sup> Dr. Prucnal testified that he analyzed the

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<sup>17</sup> Qualcomm points to *L&W, Inc. v. Shertech, Inc.*, 471 F.3d 1311 (Fed. Cir. 2006), for the proposition that Parkervision “must make a prima facie showing of infringement as to each accused device.” (Doc. 514, pp. 26–27.) *Shertech* does so hold, but it did so in the context of a motion for summary judgment—when cross-examination was not available to the accused infringer. See *Shertech*, 471 F.3d at 1316–18 (holding that the patentee “failed to satisfy its burden of showing that there is no genuine issue of material fact on the issue of infringement” where its expert assumed, “without support,” that all of the defendant’s “accused products are structurally similar” to a tested product). *TiVo* and *Spanion* are therefore the more appropriate cases for assessing



“schematics and the design documents” for each of the accused devices and formed opinions that “they are substantially the same [to Magellan] as they relate to the patents.” (Doc. 404, pp. 64–65.) Qualcomm did not explicitly cross-examine Dr. Prucnal on his “substantially the same” testimony,<sup>18</sup> and it used only Solo and Magellan documents in its cross-examination of Dr. Prucnal—at least suggesting that the products could be treated en masse for the purpose of determining infringement. Based on this record and the law, the Court rejects Qualcomm’s argument that JMOL is warranted because Parkervision “failed to present substantial evidence that the Magellan design is a representative product.” (Doc. 514, pp. 24–27.)

## **B. Direct Infringement**

Qualcomm also argues that JMOL should be entered in its favor because the record is void of the testing and analysis that is required to prove infringement of the complex technology at issue, and “the uncontradicted evidence” establishes that the “generating” and “sampling” limitations are not present in the accused products. (Doc. 514, pp. 12–24.) Parkervision counters that Qualcomm’s motion should be denied because the jury was free to disbelieve Dr. Prucnal’s harmful concessions and instead credit Dr. Prucnal’s testimony on direct and redirect examinations that the generating and sampling limitations are met in the accused products.<sup>19</sup> (Doc. 518, pp. 10–12, 16–

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Parkervision’s representative product proof in this case. *But see Medtronic Vascular, Inc. v. Bos. Scientific Corp.*, No. 2:06-cv-78, 2008 WL 2744909, at \*2–3 (E.D. Tex. July 11, 2008) (granting JMOL of non-infringement concerning untested products where “plaintiffs failed to present evidence . . . showing that the ESR of a particular model of catheter would not vary with the length of the diameter of the catheter”).

<sup>18</sup> Qualcomm cross-examined Dr. Prucnal on many other points—particularly his opinions concerning satisfaction of the “generating” and “sampling” limitations of the asserted claims.

<sup>19</sup> Qualcomm argued at the May 1 hearing that the jury was not entitled to credit Dr. Prucnal’s testimony because “he testified also that the baseband signal was



17.) The question for the Court is whether, viewed in the light most favorable to Parkervision, the evidence is such that “a reasonable jury could not arrive” at a verdict of infringement. See *Chow*, 2014 WL 92094, at \*3.

Assessment of the parties’ respective arguments requires a careful review of the trial testimony in light of the complex technology at issue. Through largely leading questions on direct examination, Dr. Prucnal initially testified that claim 82 of the ‘518 Patent is literally infringed based on his review of various schematics for the Magellan architecture products. (See Doc. 403, pp. 245–63.) According to Dr. Prucnal, the schematics show that after initial amplification, the carrier signals (I and Q) are sampled at an aliasing rate (twice per carrier cycle) by local oscillators (“LO”), which cause the switches in the Magellan mixers to close (permitting energy to flow) and open (stopping energy flow). (*Id.* at 245–52.) Dr. Prucnal then pointed to capacitors after the mixers that collect the sampled energy (see *id.* at 253–55 (noting capacitors on pages 1999 and 2001 of PX 847)), and then he agreed that he had “already shown” that “the accused products have the means for generating the baseband signal.” (*Id.* at 258–59; see also *id.* at 260–61 (noting the transimpedance amplifiers (“TIA”) after the capacitors have a low impedance that “provides a path for the discharge of the capacitor”).) Dr. Prucnal concluded that the “energy storage devices” that follow the mixers are inside the box “labeled TX filter.” (*Id.* at 262; see also Doc. 404, pp. 26–27 (looking to the TX filter output).) Thus, Dr. Prucnal concluded, claim 82 of the ‘518 Patent is literally infringed by the Magellan architecture products. (See Doc. 403, pp. 262–63.)

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generated right after the mixer. So he agreed that the lower frequency is generated off the mixer. . . . [O]nce he . . . agree[d] that you have a lower frequency signal generated there, his higher level conclusion that there’s infringement doesn’t matter.” (Doc. 537, p. 64.)

Without reference to any testing of any of the accused products,<sup>20</sup> Dr. Prucnal testified that the sampling and generating limitations in the remaining patent claims are also met by the 25% duty cycle products. (Doc. 404, pp. 8–9 (agreeing that the similarities between the claims permit a superficial analysis); see *also id.* at 16, 23–25, 27, 28–29 (stating that all of the elements of claim 23 of the ‘551 Patent are found in claim 82 of the ‘518 Patent); *id.* at 30–35 (stating that claims 25 and 161 of the ‘551 Patent are proved by comparing them to claim 90 of the ‘518 Patent); *id.* at 36–38 (stating that 193 of the ‘551 Patent infringes for the same reasons as claim 82 of the ‘518 Patent).) With respect to the accused 50% duty cycle products, Dr. Prucnal’s testimony was even more conclusory:

Q: What is the duty cycle, Dr. Prucnal?

A: The duty cycle is the period of time during a cycle during which the switch is closed.

Q: What does it mean to have a 50-percent duty cycle?

A: That means the switch is closed for half of the duty cycle and open for the other half.

Q: And what claim element does the 50-percent duty cycle assertion or does the 50-percent duty cycle issue relate to?

A: This relates to sampling.

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<sup>20</sup> On cross-examination, Dr. Prucnal confirmed that he did not do “any testing on any real Qualcomm circuits.” (Doc. 404, p. 133; see *also id.* at 195–97, 214.) Rather, Dr. Prucnal performed simulations with a computer program using his own inputs that did not model the conditions present in the accused products. (*Id.* at 133–34, 141–43, 153–56, 165, 177, 190–95; see *also id.* at 75–77.) Although Parkervision did not mention the simulations during its direct examination of Dr. Prucnal, he testified on cross-examination that he “relied” on the simulations. (*Id.* at 165–66.) In contrast, on redirect, Dr. Prucnal testified that he “did not” rely on the simulations “to arrive at [his] opinions of infringement.” (*Id.* at 230–31.) Rather, Dr. Prucnal stated that he relied only on the “circuit schematics, the technical documents, the material that I’ve shown with regard to infringement.” (*Id.* at 231.)

Q: Now based on your review of the schematics and the design documents in this case, do any of the accused products have a duty cycle that's always at 50 percent?

A: No.

Q: Can the duty cycles vary to less than 50 percent?

A: Yes.

(Doc. 404, pp. 65–66.)<sup>21</sup>

In his testimony on redirect examination, Dr. Prucnal again pointed to the charging and discharging of the capacitors as evidence of direct infringement:

[B]ecause the energy from the baseband signal—from the carrier signal is transferred through the switch. It's accumulated by the capacitor. And that energy is then used to generate the baseband signal following the capacitor. . . . [And because the switch] completes the circuit and allows energy to flow into the capacitor. If it were not a switch circuit, this would not be a capacitor that's being charged and discharged. It would just be a continuous flow. So the switch is creating the charging cycle. And then when the switch opens, that's creating the discharging cycle. And that's how the energy is then transferred from that point.

(Doc. 404, pp. 246–47.) Dr. Prucnal further testified concerning the crucial discharging of the capacitors in the TX filter:

If the TX filter were just taken out of that circuit, first of all, the TX filter is providing matching to the next stage, which is helping to enable the proper flow of current. Secondly . . . it's not a continuous flow of current from the input to the output. The TX filter is needed in order to provide the charging when the switch is closed, the storing of energy. And then when the switch is opened, be discharging. So it's a necessary part of the energy transfer.

(*Id.* at 247 (testifying “[i]f there were not a switch inside the [mixer of the] accused

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<sup>21</sup> Qualcomm contends that the foregoing testimony “is so imprecise and conclusory it cannot establish infringement.” (Doc. 514, p. 24.) The Court agrees—the 50% duty cycle products could not be found to infringe because such products are designed to carry a continuous time signal. (*See id.*) Indeed, Dr. Prucnal's testimony at trial fell short of that relied on by Parkervision to avoid summary judgment. *See supra* pp. 12–13.

products, there would be no infringement”).<sup>22</sup>

Dr. Prucnal’s direct and redirect testimony was notably vague when it came to the generating limitation. Indeed, even on redirect, Dr. Prucnal discussed the charging and discharging cycles as necessary to energy transfer—not to generating a baseband signal. (*Id.*) In contrast, Dr. Prucnal’s testimony on cross-examination was unequivocal that the double balanced mixers create the baseband before the lower frequency signal reaches the capacitors in the TX filter:

So at least in Qualcomm’s architecture, the double balanced mixture [sic] not only is capable of, it does, in fact, create the baseband before it hits the TX filter that you’re talking about now, correct?

Yes.

(*Id.* at 177; see *id.* at 199–200.) Dr. Prucnal further testified that the “output” of the double balanced mixers in the accused products “is the baseband.”<sup>23</sup> (*Id.* at 186–87, 240–41).

At the May 1 hearing, the Court asked Parkervision to explain why “Dr. Prucnal’s concession that the [base]band was created prior to the storage capacitor is not the end of the case.” (Doc. 537, pp. 92–93.) In response, counsel for Parkervision contended that Qualcomm’s arguments were somehow “divorced from the claim language and claim constructions,” and Parkervision “planted the seed” that more than one “baseband signal [or] lower frequency signal” might be created in the Qualcomm products. (*Id.* at

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<sup>22</sup>In closing, Parkervision argued that the generating limitation is proved by evidence that: “.25 microamps go into the mixer. .11 go out and into the TX filter, where it’s undisputed there are capacitors. And .11 comes out of the TX filter, the capacitors, to form the baseband signal. This proves that the baseband is generated from energy transferred into this storage device.” (Doc. 411, p. 139.)

<sup>23</sup> Mr. Sorrel’s similarly testified that there is no infringement if the accused products “get the baseband signal somehow or somewhere other than from the carrier signal energy that has been stored in the capacitor.” (Doc. 402, p. 174.)

93–94.) Parkervision contended that even if the signal after the mixer is a baseband signal, that does not mean that the “signal here after the capacitors cannot be a baseband signal.” (See *id.* at 98.) During the May 1 hearing, the Court expressed skepticism of this new infringement theory (*id.* at 99–105) and remains skeptical today.

Upon careful review of the record, the Court agrees with Qualcomm that Dr. Prucnal’s concessions during cross-examination as well as his direct testimony are fatal to Parkervision’s infringement case,<sup>24</sup> which points to the TX filter as the location of the capacitors that “generate” the baseband by charging and discharging.<sup>25</sup> (Doc. 404, pp. 178–80 (agreeing with Mr. Neal that there is “no infringement” if the capacitors in the TX filter “are used for TX filtering and not for energy sampling”).) Indeed, where similarly complex technology has been at issue, testimony like that offered by Dr. Prucnal has been held insufficient to sustain an infringement verdict. See *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1257–58 (Fed. Cir. 2010); *Johns Hopkins Univ. v. Datascope Corp.*, 543 F.3d 1342, 1348–49 (Fed. Cir. 2008); see also *Nobelpharma AB v. Implant Innovations, Inc.*, 141 F.3d 1059, 1065 (Fed. Cir. 1998).

In *Datascope*, the Federal Circuit reversed the district court’s denial of a non-infringement JMOL where the patentee’s expert testimony was “contradictory” and “totally incredible” as a matter of geometry. See *Datascope*, 543 F.3d at 1348–49; see also *Nobelpharma AB*, 141 F.3d at 1065.<sup>26</sup> Like the testimony in *Datascope*, Dr.

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<sup>24</sup> Indeed, at the outset of his infringement analysis on direct examination, Dr. Prucnal identified the baseband signal output as appearing on the “right-hand side of the mixer” designated by “BBOP and BBOM.” (Doc. 403, pp. 215–16 (explaining that BB stands for baseband, O stands for output, P stands for plus, and M stands for minus); see also *id.* at 229–32, 243–45.)

<sup>25</sup> At the May 1 hearing, Parkervision confirmed that it “chose the discharge theory” for the purpose of establishing infringement. (Doc. 537, pp. 34–35.)

<sup>26</sup> In *Nobelpharma AB*, the Federal Circuit affirmed the district court’s JMOL of

Prucnal's testimony was contradictory on some points; however, it was consistent on the crucial issue that the baseband signal is created in the Qualcomm products before the storage capacitors which precludes a finding of infringement. Accordingly, *Datascope* supports the entry of JMOL in this action. Similarly, in *Becton*, the Federal Circuit held that the district court erred in entering judgment of infringement for the patentee after a jury trial where the patentee provided no "test data or even a single live demonstration" to establish its infringement theory. *Becton*, 616 F.3d at 1257–58 (noting the district court's error in refusing to enter JMOL of non-infringement based on speculation that the hinges "might contain some stored energy").

Finally, the Court rejects Parkervision's argument that the jury's verdict may be saved by Mr. Sorrells' testimony that Parkervision's QSC6270 receiver chip (the Solo product) satisfied each of the limitations of claim 23 of the '551 Patent.<sup>27</sup> (Doc. 402, pp. 70–71, 74–89.) There is no dispute that Mr. Sorrells' opinions—like those of Dr. Prucnal—were not based on appropriate testing or simulations. Rather, Mr. Sorrells' opinions were based on a three-page technical paper published by Qualcomm (which Mr. Sorrells' initially considered for "two or three weeks")<sup>28</sup> and a reverse engineering report which provided the equivalent of schematics for a Solo chip. (See *id.* at 62; *id.* at 64, 68–71, 75–89; see also PX 842.) The depiction of the Solo chip provided by the

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invalidity in favor of the accused infringer based on the patentee's admissions concerning the adequacy of his best mode disclosure that the jury was not "at liberty to disbelieve." 141 F.3d at 1065. Like *Datascope*, *Nobelpharma AB* supports the proposition that a patentee's concessions may be sufficient to grant a defendant's JMOL motion.

<sup>27</sup> Mr. Sorrells did not testify concerning any of the other patent claims or accused products. (See Doc. 402, 89–90 (testifying that he was not prepared to testify regarding other accused products because he "was not allowed to review Qualcomm's schematics of the other chips").)

<sup>28</sup> (See Doc. 402, pp. 56–62; see also JX 43; DX 835.)

reverse engineering report permitted only the most conclusory testimony from Mr. Sorrells concerning how the limitations of claim 23 were met. (See Doc. 402, pp. 88–89 (asserting that certain “circuitry” depicted in the reverse engineering report “allows” Qualcomm “to generate the lower frequency signal from the transferred energy”).)

On cross-examination and during redirect, Mr. Sorrells testified that infringement could not be determined absent detailed information concerning how a particular circuit functions—not just its components. (See Doc. 402, pp. 102–03, 105, 113, 120–21, 148–49, 152, 163, 175–76; *see also id.* at 241–42.) Dr. Prucnal further testified that infringement could not be determined absent review of materials that were unavailable to Mr. Sorrells. (See Doc. 404, pp. 7–8 (stating that only the schematics and design documents unavailable to Mr. Sorrells provided the “necessary detail” for an infringement determination); *id.* at 73.) Such testimony buttresses the Court’s conclusion as to the inadequacy of Mr. Sorrells’ testimony. *See Datascope*, 543 F.3d at 1348–49; *see also Nobelpharma AB*, 141 F.3d at 1065.

Given the technology at issue, the Court finds that Mr. Sorrells’ superficial analysis is an insufficient evidentiary basis for the jury’s infringement verdict in this action. *See Becton*, 616 F.3d at 1257–58. Further, denial of Qualcomm’s motion concerning non-infringement would have to be based on speculation from Mr. Sorrells and disregard of Dr. Prucnal’s plain testimony concerning the output of the mixers.<sup>29</sup> While the Court is loath to overturn the jury’s verdict,<sup>30</sup> on this record, it is the Court’s

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<sup>29</sup> *Becton*, *Datascope*, and *Nobelpharma AB* are persuasive cases for Qualcomm, and Parkervision did not address the cases in its response. (See Doc. 518.)

<sup>30</sup> The jury was attentive and deliberated for a significant period of time. Nonetheless, it reached a conclusion not supported by the evidence presented. The jury’s verdict of infringement on the Marimba products is consistent with the conclusion that the jury’s verdict was not supported by the record evidence. *See supra* p. 5, note 6.



only choice. Accordingly, the Court finds that Qualcomm's motion (Docs. 501, 514) is due to be granted. In the alternative, the Court finds that a new trial on infringement is required.

## VALIDITY

### I. Standards

35 U.S.C. § 102 provides that "[a] person shall be entitled to a patent unless . . . the invention was . . . described in a printed publication . . . or otherwise available to the public before the effective filing date of the claimed invention." 35 U.S.C. § 102(a)(1); see *Am. Calcar, Inc. v. Am. Honda Motor Co.*, 651 F.3d 1318, 1341 (Fed. Cir. 2011). To anticipate a claim under § 102, "a single prior art reference must expressly or inherently disclose each claim limitation." See *Finisar Corp. v. DirecTV Grp., Inc.*, 523 F.3d 1323, 1334 (Fed. Cir. 2008); see also *Exergen Corp. v. Wal-Mart Stores, Inc.*, 575 F.3d 1312, 1318 (Fed. Cir. 2009) (reversing denial of motion for JMOL that patent was anticipated). "[A] limitation or the entire invention is inherent and in the public domain if it is the 'natural result flowing from' the explicit disclosure." *Schering Corp. v. Geneva Pharms.*, 339 F.3d 1373, 1379 (Fed. Cir. 2003) (citation omitted).

Anticipation is a question of fact. *SynQor, Inc.*, 709 F.3d at 1373. It requires "a comparison of the construed claim to the prior art." *In re Omeprazole Patent Litig.*, 483 F.3d 1364, 1371 (Fed. Cir. 2007). When the technology at issue is complex, expert testimony may be required, *Alexsam, Inc. v. IDT Corp.*, 715 F.3d 1336, 1347 (Fed. Cir. 2013), and it must not be too general and conclusory: "Typically, testimony concerning anticipation must be testimony from one skilled in the art and must identify each claim element, state the witnesses' interpretation of the claim element, and explain in detail how each claim element is disclosed in the prior art reference." *Koito Mfg. Co. v. Turn-*



*Key-Tech, LLC*, 381 F.3d 1142, 1152 (Fed. Cir. 2004) (citation omitted).

To establish its anticipation defense, Qualcomm must overcome the presumption of validity found in the first paragraph of 35 U.S.C. § 282, “which provides that ‘[a] patent shall be presumed valid’ and ‘[t]he burden of establishing invalidity . . . rest[s] on the party asserting such invalidity.’” *Microsoft Corp. v. i4i Ltd. P’ship*, 131 S. Ct. 2238, 2243 (2011) (quoting § 282). Clear and convincing evidence must be produced to overcome this presumption. See *id.* This burden of proof is pertinent to the Court’s consideration of Qualcomm’s motion for JMOL. See *Mentor H/S, Inc. v. Med. Device Alliance, Inc.*, 244 F.3d 1365, 1375 (Fed. Cir. 2001) (“Courts grant JMOL for the party bearing the burden of proof only in extreme cases, when the party bearing the burden of proof has established its case by evidence that the jury would not be at liberty to disbelieve and the only reasonable conclusion is in its favor.”).

## II. Discussion

### A. JMOL

Qualcomm’s invalidity defense is that the asserted claims are anticipated by three references that were not considered by the PTO:

Reference	Claims Allegedly Invalidated
Peter A. Weisskopf, Subharmonic Sampling of Microwave Signal Processing Requirements, <i>Microwave Journal</i> (May 1992) (DX 534) (“ <b>Weisskopf</b> ”)	Claims 23, 25, 161, 193, and 202 of the ‘551 Patent  Claims 27, 82, 90, and 91 of the ‘518 Patent  Claim 2 of the ‘371 Patent
P. Estabrook and B.B. Lusignam, A Mixer Computer-Aided Design Tool Based in the Time Domain, <i>IEEE MTT-S Digest</i> (1988) (DX369) (“ <b>Estabrook</b> ”)	Claims 23, 161, and 202 of the ‘551 Patent  Claims 27, 82, 90, and 91 of the ‘518 Patent  Claim 2 of the ‘371 Patent
Doug DeMaw, <i>Practical RF Design Manual</i> , 118–213 (1982) (“ <b>DeMaw</b> ”)	Claim 18 of the ‘342 Patent

According to Qualcomm, JMOL is warranted because the above references and the testimony of Dr. Razavi provided un rebutted proof of anticipation, and Parkervision presented no contrary evidence and obtained no relevant admissions from Dr. Razavi on cross-examination. (Doc. 499, p. 5.) Qualcomm argues in the alternative that a new trial is warranted because the jury was not instructed on the disparagement doctrine or given an *i4i* instruction as Qualcomm requested, and Parkervision's arguments concerning the generating limitation contradicted the Court's claim construction. (Doc. 499, pp. 28–29.)

Parkervision counters that JMOL is inappropriate because "the jury could have reasonably concluded that Dr. Razavi's testimony was not credible" because he: (1) "was repeatedly impeached," (2) "omitted claim limitations and constructions," (3) "admitted to errors in his simulations," and (4) "advanced an understanding of the claim terms incongruent with that offered by Qualcomm for infringement purposes." (Doc. 516, pp. 5–6.) Parkervision argues that "Dr. Razavi's testimony failed to show that: (1) the 'energy transfer' limitations as construed by the Court were disclosed by . . . Weisskopf or Estabrook"; and (2) the "sampling" limitation was disclosed by . . . DeMaw. (*Id.* at 5.) Parkervision further argues that the Court should reject Qualcomm's jury instruction arguments because Qualcomm has not shown the instructions were "legally erroneous" or had a prejudicial effect on the jury. (*Id.* at 14–17.) Finally, Parkervision contends that it did not disregard or contradict the Court's construction of the "generating" limitation. (*Id.* at 21.)

Qualcomm's most compelling argument is that JMOL or a new trial is required because Parkervision's validity opposition (with respect to Weisskopf) is premised on an

incorrect claim construction. (Doc. 499, pp. 9, 11–14 (arguing that Parkervision’s decisions “to disobey” the Court’s claim construction position, “misrepresent the Weisskopf reference, and distract the jury with . . . theatrics left Parkervision with a record that requires JMOL of invalidity and, at a minimum, a new trial”).) Specifically, Qualcomm contends that Parkervision’s validity opposition at trial depended on a finding that the “generating” limitations required a “discharge” of energy. (*Id.* at 1–12.) Qualcomm cites four Federal Circuit cases in support of this argument: (1) *Exergen Corp. v. Wal-Mart Stores, Inc.*, 575 F.3d 1312, 1319 (Fed. Cir. 2009); (2) *Ecolab, Inc. v. FMC Corp.*, 569 F.3d 1335, 1347 (Fed. Cir. 2009);<sup>31</sup> (3) *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 632 (Fed. Cir. 1987); and (4) *Am. Calcar, Inc. v. Am. Honda Motor Co.*, 651 F.3d 1318, 1341–42 (Fed. Cir. 2011).<sup>32</sup>

In *Verdegaal Bros.*, *Exergen Corp.*, and *Ecolab*, the Federal Circuit held that the district courts erred in denying motions for JMOL on invalidity. The patentees in *Verdegaal Bros.* and *Exergen Corp.* conceded that only one limitation was absent from the prior art references. *Verdegaal Bros.*, 814 F.2d at 632; *Exergen Corp.*, 575 F.3d at 1318–19. In both cases, the Federal Circuit rejected the patentees’ arguments that the sole limitation was absent from the prior art because the claims did not include the limitations as advanced by the patentees. *Verdegaal Bros.*, 814 F.2d at 632 (holding that the patentee’s distinction was “inappropriate” because there was “no limitation in

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<sup>31</sup> In *Ecolab*, the Federal Circuit held that the “broadly” written claim language did not support the patentee’s argument that “the claimed method is distinct from Labadie because the claimed method is directed to applying peracetic acid to beef [to] reduce microbial populations in the complex setting of a processing plant.” *Ecolab, Inc.*, 569 F.3d at 1347 (citation and internal quotation marks omitted).

<sup>32</sup> *American Calcar* supports Qualcomm’s argument indirectly. In *American Calcar*, the Federal Circuit reversed a district court’s JMOL of invalidity, but there, the incorrect claim construction on which the erroneous validity determination was based was provided by the district court—not the patentee. *Am. Calcar*, 651 F.3d at 1341–42.

the subject claims with respect to the rate at which sulfuric acid is added”); *Exergen Corp.*, 575 F.3d at 1319 (“[N]othing in claim 1 of the ‘205 patent requires the detector to detect radiation solely from the biological tissue.”).

Unlike the plaintiffs in *Verdegaal Bros.* and *Exergen*, Parkervision has not conceded that the “generating” limitations are the only ones at issue as to Weisskopf.<sup>33</sup> Further, Parkervision does not dispute that it represented at trial that generating a lower frequency or baseband signal requires discharge of energy. (Doc. 516, p. 12 (noting that “Dr. Prucnal and Mr. Sorrells opined that the plain and ordinary meaning of the ‘generating’ limitations required the repeated charging and discharging of a capacitor”).) Nonetheless, Parkervision argues that the Court should reject Qualcomm’s arguments as waived because Qualcomm did not object: (1) to the testimony of Dr. Prucnal or Mr. Sorrells; (2) during Parkervision’s cross-examination of Dr. Razavi that “generating” requires discharge;<sup>34</sup> and (3) to the Court’s instruction to the jury to apply the “plain

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<sup>33</sup> Otherwise, *Verdegaal Bros.* and *Exergen Corp.* do support Qualcomm’s argument, and Parkervision made no effort to distinguish the cases in its response or at the May 1 hearing. (See Doc. 516.)

<sup>34</sup> For instance, Parkervision cross-examined Dr. Razavi concerning the Rebuttal Expert Report of Peter Weisskopf (which was not in evidence) on the ground that Dr. Razavi’s opinions differed from Weisskopf. Weisskopf’s rebuttal opinion that his article did not invalidate the claims of the patents-in-suit was premised on the “generating” limitations not being met because his article did not disclose the “discharge of energy.” (Doc. 269-10, pp. 12–15 (“In summary, my paper teaches a voltage sample-and-hold circuit having a sufficiently high impedance load such that the voltage on the storage capacitor can be measured *without* discharging energy from the capacitor.”).) Parkervision then argued in closing that Weisskopf “himself has filed a declaration in this case in which Weisskopf says his article doesn’t show the same thing as the Parkervision patents. They don’t anticipate.” (Doc. 411, pp. 100–01 (“The article describes a sample and hold process. That’s not what the invention does. It doesn’t hold the energy. It transfers it.”); *id.* (“Dr. Razavi told you that he is extraordinary and knows more about the Weisskopf reference than Mr. Weisskopf himself, who says he didn’t describe in his article what the patent describes.”).) Qualcomm did not object, and in its closing, it only argued that the jury should discount the arguments regarding Weisskopf because he did not testify and was paid by Parkervision. (Doc. 411, p. 129.)

meaning” of the term “generating.” (*Id.* at 23–24.) Further, Parkervision contends that its attorney’s argument that Weisskopf and Estabrook do not anticipate was not conduct that impaired “the calm and dispassionate consideration of the case by the jury.” (*Id.* at 23 (quoting *BankAtlantic v. Blythe Eastman Paine Webber, Inc.*, 955 F.2d 1467, 1474 (11th Cir. 1992).)

Parkervision also argues that the jury could reject Dr. Razavi’s testimony that Weisskopf anticipates the “generating” limitations because Dr. Razavi provided contradictory testimony at his deposition and at trial concerning whether “the energy in the capacitor shown in figure 2 . . . is not discharged to create the lower frequency signal.” (*Id.* at 11.) Parkervision also argues that the jury could find that the “energy transfer” limitations were not satisfied because Dr. Razavi failed to testify that the Weisskopf and Estabrook references disclose transferring amounts of energy from the carrier signal “*in amounts distinguishable from noise*” as required under the claim construction. (*Id.* at 7–8.)

The technology in this action and the prior art are of such complexity that Qualcomm cannot establish that it is entitled to JMOL on anticipation absent expert testimony from Dr. Razavi that the jury was “not at liberty to disbelieve.” See *Mentor H/S, Inc.*, 244 F.3d at 1375; *Alexsam*, 715 F.3d at 1347; *Koito Mfg., Co.*, 381 F.3d at 1149. Parkervision’s arguments that the jury had sufficient basis to disbelieve Dr. Razavi’s testimony are persuasive. (Doc. 516.) Accordingly, despite compelling arguments by Qualcomm concerning the “generating” limitations, it would be error to disturb the jury’s verdict that Qualcomm did not prove by clear and convincing evidence that all of the asserted claims were anticipated by Weisskopf, Estabrook, and DeMaw.

## B. New Trial

Qualcomm contends that it is entitled to a new trial for all the same reasons that JMOL is warranted and because the Court erred in not giving an *i4i* instruction or an instruction that “[a] reference is no less anticipatory if, after disclosing the invention, the reference then disparages it.” *Celeritas Techs., Ltd. v. Rockwell Int’l Corp.*, 150 F.3d 1354, 1361 (Fed. Cir. 1998). Qualcomm proposed the instruction before trial. (Doc. 336-8, p. 57.) Parkervision concedes that if it had “put forward affirmative misstatements of the law [concerning disparagement] in an attempt to mislead the jury . . . an instruction may very well have been warranted. [But, we] didn’t do that.” (Doc. 537, p. 41.)

The Federal Circuit “reviews the legal sufficiency of jury instructions on an issue of patent law without deference to the district court.” *DSU Med. Corp. v. JMS Co.*, 471 F.3d 1293, 1304 (Fed. Cir. 2006). To alter a judgment based on erroneous jury instructions, the moving party must establish that: “(1) it made a proper and timely objection to the jury instructions, (2) those instructions were legally erroneous, (3) the errors had prejudicial effect, and (4) it requested alternative instructions that would have remedied the error.” *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282, 1311–12 (Fed. Cir. 2005) (citation and quotation marks omitted); see *Bettcher Indus., Inc. v. Bunzl USA, Inc.*, 661 F.3d 629, 639 (Fed. Cir. 2011). The Federal Circuit orders a new trial based on jury instruction errors when the “instructions as a whole clearly mislead the jury.” *DSU Med. Corp.*, 471 F.3d at 1304.

In hindsight, and especially given Parkervision’s closing arguments, *i4i* and disparagement instructions would likely have been appropriate. Nonetheless, viewing the Court’s instructions as a whole, the Court cannot find that omission of the disparagement and *i4i* instructions misled the jury and requires a new trial on validity.

## CONCLUSION

Accordingly, it is hereby **ORDERED AND ADJUDGED**:

1. Qualcomm's Renewed Motion for Judgment as a Matter of Law and Motion for New Trial Regarding Invalidity (Doc. 499) is **DENIED**.
2. Qualcomm's Renewed Motion for Judgment as a Matter of Law and Motion for New Trial Regarding Non-Infringement (Docs. 501 (redacted version)); (Doc. 514 (sealed version)) are **GRANTED**.
3. The parties' remaining motions (Docs. 466, 488–90, 497, 500, 521–24) are **DENIED AS MOOT**.
4. The Clerk is **DIRECTED** to enter judgment in favor of Qualcomm and against Parkervision and to close this case.

**DONE AND ORDERED** in Chambers in Jacksonville, Florida, on June 20, 2014.

  
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ROY B. DALTON JR.  
United States District Judge

Copies:

Counsel of Record

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF FLORIDA  
JACKSONVILLE DIVISION**

PARKERVISION, INC.,

Plaintiff,

v.

Case No. 3:11-cv-719-OrlTEM

QUALCOMM INCORPORATED,

Defendant.

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**ORDER**

This matter comes before the Court on the following:

1. Parkervision's Daubert Motion to Exclude Portions of the Expert Report and Testimony of Gregory Leonard and Behzad Razavi (Doc. 285), filed July 8, 2013;
2. Qualcomm's Daubert Motion to Exclude Paul Benoit's Damages Testimony and Memorandum in Support (Doc. 288), filed July 8, 2013;
3. Qualcomm's Response to Parkervision's Daubert Motion to Exclude Portions of the Expert Report and Testimony of Gregory Leonard and Behzad Razavi (Doc. 303) filed July 25, 2013; and
4. Parkervision's Response to Qualcomm's Daubert Motion to Preclude Paul Benoit's Damages Testimony (Doc. 305) filed July 25, 2013.

**BACKGROUND**

In this patent litigation, Plaintiff Parkervision Inc. and Defendant Qualcomm Incorporated each filed motions in limine challenging the opinion testimony of the other's expert witnesses (Parkervision's Paul Benoit and Qualcomm's Gregory Leonard and



Behzad Razavi). (Doc. 285 (“Parkervision’s Daubert Motion”); Doc. 288 (“Qualcomm’s Daubert Motion”).) Both parties also filed responses in opposition to the Daubert Motions. (Doc. 303 (“Qualcomm’s Response”); Doc. 305 (“Parkervision’s Response”).)

On September 30, 2013, the Court held a hearing concerning the parties’ respective Daubert motions (the “*Daubert* Hearing”). (Doc. 375.) At the *Daubert* Hearing, the parties presented the testimony of proposed damages witnesses Gregory Leonard and Paul Benoit. (*Id.*) The testimony of Behzad Razavi was not presented because Qualcomm withdrew its enablement defense; thus, Parkervision’s *Daubert* Motion is moot as to Behzad Razavi. (*Id.* at 78-79, 99-100.) As to Gregory Leonard and Paul Benoit, the Daubert Motions are now ripe for resolution.

## STANDARDS

### I. Rule 702 and Daubert

Federal Rule of Evidence 702 sets out the following requirements for expert opinion testimony:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

Fed. R. Evid. 702. The party offering the expert’s opinion testimony bears the burden of satisfying the requirements of Rule 702 by a preponderance of the evidence. *Rink v. Cheminova, Inc.*, 400 F.3d 1286, 1292 (11th Cir. 2005).

Under Rule 702 and the Supreme Court decision governing its application, *Daubert v. Merrell Dow Pharm.*, 509 U.S. 579 (1993), district courts must act as gatekeepers, admitting expert testimony only if it is both reliable and relevant, to prevent

speculative and unreliable testimony from reaching the jury.<sup>1</sup> *Rink*, 400 F.3d at 1291; *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 711 F.3d 1348, 1373 (Fed. Cir. 2013); *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1315 (Fed. Cir. 2011). As gatekeeper, the district court must consider whether: (1) the expert is qualified to testify competently regarding the matters that he intends to address; (2) the methodology by which the expert reaches his conclusions is sufficiently reliable as determined by the sort of inquiry mandated in *Daubert*; and (3) the testimony assists the trier of fact, through the application of scientific, technical, or specialized expertise, to understand the evidence or to determine a fact in issue. *City of Tuscaloosa v. Harcross Chems., Inc.*, 158 F.3d 548, 562-63 (11th Cir. 1998); e.g., *Cooper v. Marten Transp., Ltd.*, No. 13-10920, 2013 WL 5381152, at \*4 (11th Cir. Sept. 27, 2013) (affirming exclusion of expert testimony due to unreliable methodology).

While stringent, the standards set forth in *Daubert* and Rule 702 are “not guarantees of correctness.” *i4i Ltd. P’ship v. Microsoft Corp.*, 598 F.3d 831, 852 (Fed. Cir. 2010), *aff’d*, 131 S. Ct. 2238 (2011). “When the methodology is sound, and the evidence relied upon sufficiently related to the case at hand, disputes about the degree of relevance or accuracy (above this minimum threshold) may go to the testimony’s weight, but not its admissibility.” *Id.*; see also *United States v. Ala. Power Co.*, No. 11-12168, 2013 WL 5273804, at \*3 (11th Cir. Sept. 19, 2013) (explaining that the *Daubert* inquiry “is not intended to supplant” cross-examination and presentation of contrary evidence).

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<sup>1</sup> In *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141 (1999), the U.S. Supreme Court extended its reasoning in *Daubert* to non-scientist experts.

## II. Patent Damages

“A patentee is entitled to no less than a reasonable royalty on an infringer’s sales.”<sup>2</sup> 35 U.S.C. § 284 (1994). “A reasonable royalty can be calculated” from “an established royalty,” or from “the infringer’s profit projections for infringing sales, or [from] a hypothetical negotiation between the patentee and infringer based on the factors in *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F.Supp. 1116, 1120 (S.D.N.Y. 1970).” *Wordtech Sys., Inc. v. Integrated Networks Solutions, Inc.*, 609 F.3d 1308, 1319 (Fed. Cir. 2010). The U.S. Court of Appeals for the Federal Circuit has “consistently upheld experts’ use of a hypothetical negotiation and *Georgia-Pacific* factors for estimating a reasonable royalty.” *i4i Ltd. P’ship*, 598 F.3d at 854.

The fifteen *Georgia-Pacific* factors are a “comprehensive (but unprioritized and often overlapping) list of relevant factors for a reasonable royalty calculation.” *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 869 (Fed. Cir. 2010). Several *Georgia-Pacific* factors relate to the general market for the patent, such as: (1) the “royalties the patentee has received for licensing the patent to others” (“Factor One”); (2) the “rates paid by the licensee for the use of comparable patents” (“Factor Two”); (3) “any established policies or marketing programs by the licensor to maintain its patent monopoly by not licensing others to use the invention or granting licenses under special conditions to maintain the monopoly” (“Factor Four”); and (4) the portion of profit or selling price that may be customary in that business “to allow for use of the invention or analogous inventions” (“Factor Twelve”). *i4i Ltd. P’ship*, 598 F.3d at 853 n.3.

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<sup>2</sup> “The patentee bears the burden of proving damages.” *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1315 (Fed. Cir. 2011). To properly carry this burden, the patentee must “sufficiently [tie the expert testimony on damages] to the facts of the case.” *Id.* (quoting *Daubert*, 509 U.S. at 591). “If the patentee fails to tie the theory to the facts of the case, the testimony must be excluded.” *Id.*

Other *Georgia-Pacific* factors consider facts unique to the parties in the hypothetical negotiation: (1) “the commercial relationship between the licensor and licensee, such as whether they are competitors” (“Factor Five”); (2) the nature and scope of the hypothetical license, such as whether it is exclusive or nonexclusive (“Factor Three”); and (3) “the duration of the patent and license term” (“Factor Seven”). *Id.*

Another set of *Georgia-Pacific* factors concerns the value of the technology at issue as measured by: (1) “the established profitability of the product made under the patent, including its commercial success and current popularity” (“Factor Eight”); (2) “the utility and advantages of the patent property over old modes or devices” (“Factor Nine”); (3) “the nature of the patented invention and the benefits to those who have used the invention” (“Factor Ten”); (4) “the extent to which the infringer has used the invention and the value of that use” (“Factor Eleven”); (5) “the portion of the realizable profit that should be credited to the invention as opposed to its non-patented elements” (“Factor Thirteen”); and (6) “the effect of selling the patented specialty in promoting sales of other products of the licensee” (“Factor Six”). *i4i Ltd. P’ship*, 598 F.3d at 853 n.3.

Finally, the *Georgia Pacific* factors permit consideration of: (1) “the opinion testimony of qualified experts” (“Factor Fourteen”); and (2) “the results of a hypothetical negotiation between the licensor and licensee” (“Factor Fifteen”). *Id.*

## DISCUSSION

### I. Comparability of Licenses, Negotiations, and Transactions

Both parties challenge the other party’s damages expert’s reliance on certain licenses, negotiations, and transactions in their respective damages analyses. Both parties rely on *Lucent Technologies, Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1327 (Fed.

Cir. 2009), *ResQNet.com, Inc.*, 594 F.3d at 869,<sup>3</sup> *Wordtech Sys., Inc.*, 609 F.3d at 1319,<sup>4</sup> and *Uniloc USA, Inc.*, 632 F.3d at 1315, to support their respective positions. Both parties' arguments are partially meritorious, as explained below.

In *Lucent Techs., Inc.*, *ResQNet.com, Inc.*, *Wordtech Sys., Inc.*, and *Uniloc USA, Inc.*, the Federal Circuit reemphasized that patentees seeking to establish a reasonable royalty cannot "rely on license agreements" that are "radically different from the hypothetical agreement under consideration." *Lucent Techs., Inc.*, 580 F.3d at 1327; e.g., *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1211 (Fed. Cir. 2010) ("We have recently reiterated that use of past patent licenses under [Georgia-Pacific Factors One and Two] must account for differences in the technologies and economic circumstances of the contracting parties."). Rather, the "licenses relied on by the patentee in proving damages [must be] sufficiently comparable to the hypothetical license at issue in suit." *Lucent Techs.*, 580 F.3d at 1325; *Uniloc*, 632 F.3d at 1317 (holding that "there must be a basis in fact to associate the royalty rates used in prior licenses to the particular hypothetical negotiation at issue in the case"). There must be a minimally sufficient connection between the license and the patent and "actual

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<sup>3</sup> In *ResQNet.com, Inc.*, the patentee's expert witness on damages improperly used "licenses with no relationship to the claimed invention to drive the royalty rate up to unjustified double-digit levels." 594 F.3d at 870. The *ResQNet.com, Inc.* court noted that none of the licenses relied on "even mentioned the patents-in-suit or showed any other discernible link to the claimed technology." *Id.* The Federal Circuit remanded to the district court for a new damages analysis with a warning that "the trial court should not rely on unrelated licenses to increase the reasonable royalty rate above rates more clearly linked to the economic demand for the claimed technology." *Id.* at 872-73.

<sup>4</sup> In *Wordtech Systems, Inc.*, the patentee was defending a jury verdict which awarded more than twice the damages that the patentee had requested. 609 F.3d at 1319. The patentee had presented no expert testimony concerning damages at trial; rather, it submitted copies of thirteen licenses and the testimony of its president. *Id.* at 1321. The *Wordtech Systems, Inc.* court held that the proffered evidence did not provide support for the jury verdict because the licenses were too different from the hypothetical negotiation. *Id.* at 1322.

findings” accounting for “technological and economic differences between the licenses.” *ResQNet.com, Inc.*, 594 F.3d at 873.

#### **A. Hypothetical Negotiation**

“[T]he purpose of the hypothetical negotiation framework” is to “discern the value of the patented technology to the parties in the marketplace when the infringement began.” *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 694 F.3d 51, 75-76 (Fed. Cir. 2012) (remanding action for a new hypothetical negotiation analysis based on correct date of first infringement). Thus, the hypothetical negotiation must relate to the “date of first infringement.” *Applied Med. Res. Corp. v. U.S. Surgical Corp.*, 435 F.3d 1356, 1363-64 (Fed. Cir. 2006).

Here, the parties agree that January 2006 is the date for the hypothetical negotiation. (Doc. 305, Ex. 1, ¶¶ 137, 185.) The parties also agree that: (1) the hypothetical license would have been non-exclusive, bare, and based on a running royalty; (2) the hypothetical license would have covered only the Patents-in-Suit; and (3) the products covered under the license would include receivers, transceivers, and integrated transceiver/baseband products used or sold in the United States. (*Id.* ¶¶ 142-43, 173.) Further, Parkervision concedes that it was not a competitor of Qualcomm in January 2006; rather, Parkervision’s business model at that time was to license its intellectual property. (*Id.* ¶¶ 174-75.) It is against these hypothetical facts that any license or transaction must be compared.

#### **B. The 1999 Documents & Negotiations**

Qualcomm argues that Benoit’s analysis is fatally flawed because it is based on Qualcomm’s internal “business models” created in early 1999 to explore possible business relationships and licensing arrangements with Parkervision (Doc. 288). (Doc.

303, Exhibit 1, ¶¶ 61-62, 67-68, 70-72, Exs. 4-6 (the “1999 Documents”); *id.* ¶¶ 130-31, 220-23, 228, 233; *id.* Exs. C, D.4, N, N.1, N.2; Doc. 375, pp. 10-11, 30-32, 44-45, 63-64, 69.) According to Qualcomm, Benoit’s reliance on cherry-picked, seven-year-old, internal documents to establish a reasonable royalty is “unprecedented.” (Doc. 375, pp. 48-49.) Parkervision counters that: (1) Benoit’s methodology is sound under *Powell v. Home Depot U.S.A., Inc.*, 663 F.3d 1221 (Fed. Cir. 2011); (2) the 1999 Documents are the “best evidence” of how Qualcomm would value the patented technology; (3) Benoit’s analysis is not a comparison of past patent licenses under Factors One and Two; and (4) Benoit adequately addresses the differences between the 1999 negotiations and a hypothetical negotiation. (Doc. 305 pp. 1-9.)

Upon consideration, the Court agrees with Qualcomm that Benoit’s analysis is too speculative and unreliable given radical differences between the hypothetical negotiation and the 1999 negotiations, as well as the vast temporal chasm. For instance, the parties do not dispute that between 1999 and 2006, there were seismic changes in the marketplace for wireless receivers, transceivers, and baseband chips. (Doc. 305, Ex. 1, ¶ 238; Doc. 375, pp. 36-38.) Further, both Parkervision and Qualcomm’s business models had changed between 1999 and 2006. (Doc. 375 pp. 11-12 (acknowledging that Qualcomm “was totally out of the handset market by 2006”); *id.* at 51-53 (“Qualcomm was a 2G CDMA-only handset maker” in 1999); Doc. 305, Ex. 1 ¶¶ 42-43, 46-48) Further, in 1999, there is no dispute that Qualcomm had noninfringing alternatives to the patented technology. (Doc. 375, pp. 40-41, 65-66; Doc. 305, Ex. 1, ¶¶ 116-19.) While the 1999 negotiations contemplated a technology transfer with exclusivity for Qualcomm (Doc. 375, pp. 75-76; Doc. 305, Ex. 22 to Ex. 1), the 2006 hypothetical negotiation was for a bare, non-exclusive patent license. Finally, in 1999,



Parkervision had only patent applications. In 2006, three of the Patents-in-Suit had issued.

Given the foregoing, there can be little dispute that the 1999 documents and negotiations are too different from the hypothetical negotiation to provide a reliable foundation for Benoit's economic analysis.<sup>5</sup> See *Lucent Techs., Inc.*, 580 F.3d at 1327; *ResQNet.com, Inc.*, 594 F.3d at 869; *Wordtech Sys., Inc.*, 609 F.3d at 1319; *Uniloc USA, Inc.*, 632 F.3d at 1315; e.g., *EPlus, Inc. v. Lawson Software, Inc.*, 700 F.3d 509, 522-23 (Fed. Cir. 2012) (affirming exclusion of damages expert who relied on four-year-old settlement licenses to the exclusion of smaller, temporally comparable settlement licenses). Further, the Court is not persuaded by Parkervision's argument that Benoit adequately accounts for all of the differences and the time gap. While analysis of some of the differences between 1999 and 2006 might be permissible under the law, the sheer volume and significance of the differences between the 1999 negotiations and the 2006 hypothetical negotiation make that approach unworkable in this case.

The Court similarly rejects Parkervision's effort to immunize the 1999 Documents and negotiations from the comparability requirements by arguing that they are not pertinent to *Georgia-Pacific* Factor One.<sup>6</sup> *Dataquill Ltd. v. High Tech Computer Corp.*, No. 08-cv-543, 2012 WL 1284381, at \*6 (S.D. Cal. Apr. 16, 2012) (precluding expert from extrapolating a reasonable royalty from a revenue-sharing agreement). The Court

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<sup>5</sup> The Court does not reject the 1999 Documents and negotiations simply because they were unsuccessful, although this fact does counsel against use of the evidence. *Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 25-34 (Fed. Cir. 2012), *cert. denied*, 133 S. Ct. 1291 (2013) (noting that "proposed licenses may have some value for determining a reasonable royalty"; however, their "evidentiary value is limited").

<sup>6</sup> The Court notes that Benoit analyzed the 1999 Documents and negotiation in the portion of his Report addressing Factor One. (Doc. 305, Ex. 1, ¶¶ 159-64.)



also finds that *Powell* and other cases cited by Parkervision actually undermine its argument. Indeed, the *Powell* court recognized that unsuccessful negotiations in 2004 did *not* provide a “reliable approximation of the upper limit that the parties would have reached during a hypothetical negotiation in May 2006.” *Powell*, 663 F.3d at 1238; *cf. Interactive Pictures Corp. v. Infinite Picture, Inc.*, 274 F.3d 1371, 138-86 (Fed. Cir. 2001) (affirming reasonable royalty judgment based on internal business plan that was only two-months-old at the time of the hypothetical negotiation).

Parkervision has not met its burden to establish by a preponderance of the evidence that Benoit’s opinions based on the 1999 Documents satisfy the requirements of Rule 702. To the contrary, opinions based on Qualcomm’s internal financial projections created seven years before the hypothetical negotiation are too speculative and unreliable to be helpful to the jury. Accordingly, the Court will preclude Benoit from relying on the 1999 Documents and negotiations.

### **C. The VIA Agreement**

Parkervision argues that Leonard’s reliance on a 2007 license agreement between Parkervision and VIA (the “VIA Agreement”) should be excluded because it “contravenes” *ResQNet.com, Inc.*, *Uniloc USA, Inc.*, and *Lucent Technologies, Inc.* (Doc. 285, pp. 3-7.) Qualcomm counters that the VIA Agreement is pertinent to Factor One and is the “most comparable license” available to the parties. (Doc. 303, p. 1.) According to Qualcomm, the VIA Agreement “covers the right patents and the right products at the right time,” and Leonard properly accounted for the differences between the hypothetical negotiation and the VIA Agreement. (*Id.* at 1, 7-11; Doc. 305, Ex. 1, ¶¶154-58.) The Court agrees with Qualcomm. Thus, Leonard will not be precluded from relying on the VIA Agreement in opining on an appropriate reasonable royalty in

this case. See *Dataquill Ltd.*, 2012 WL 1284381, at \*6 (declining to preclude expert from relying on comparable license); *VIRNETX, Inc. v. Apple Inc.*, 925 F. Supp. 2d 816, 837-38 (E.D. Tex. 2013) (permitting reliance on agreements over objections of non-comparability).

#### **D. The Berkana Acquisition**

Parkervision next challenges “Leonard’s secondary analysis based on Qualcomm’s acquisition of Berkana Wireless, Inc.” because “it is not a comparable transaction to the hypothetical patent license at issue.” (Doc. 285, pp. 7-11.) Qualcomm counters that Leonard’s reliance on the Berkana Acquisition was “proper” under *Georgia-Pacific* Factors Nine, Ten, and Eleven. (Doc. 303, pp. 11-13.) The Court agrees with Parkervision. The Berkana acquisition was not a patent license at all. (Doc. 375, p. 95.) Moreover, the pertinent technology obtained by Qualcomm as part of the acquisition was not patented. (Doc. 375, pp. 91-92.) These foundational distinctions between the Berkana Acquisition and the hypothetical negotiation cannot be overcome. (*Id.* at 105-106.) Further, the Court is not persuaded that the Berkana Acquisition is immunized from comparability requirements because Leonard claims that he did not consider it in the context of Factors One and Two. See *Dataquill Ltd.*, 2012 WL 1284381, at \*7-8 (precluding expert from extrapolating a reasonable royalty from a revenue-sharing agreement). Accordingly, Leonard may not rely on the Berkana acquisition to opine on the amount of a reasonable royalty in this action.

#### **E. The WRF Agreement**

Parkervision also challenges Leonard’s reliance on a license agreement between Qualcomm and WRF (the “WRF Agreement”). (Doc. 285, pp. 11-13.) At the *Daubert* Hearing, Qualcomm appropriately conceded that the WRF Agreement was not

comparable to the hypothetical negotiation, and it did not impact Leonard's opinions. (Doc. 375, pp. 81, 97-98, 108-10.) Rather, Leonard treated the WRF Agreement merely as a data point that he felt compelled to consider. (*Id.*)

The Court agrees that the WRF Agreement is insufficiently comparable to the hypothetical negotiation to be considered in opining on a reasonable royalty in this action. This is so because the WRF Agreement involved a lump-sum payment from Qualcomm to resolve patent infringement litigation six years *after* the hypothetical negotiation. (Doc. 305, Ex. 1, ¶¶ 168-72.) Accordingly, the WRF Agreement should not be considered in opining on a reasonable royalty in this action. See *AVM Techs., LLC v. Intel Corp.*, 927 F. Supp. 2d 139, 143 (D. Del. 2013) (excluding expert testimony that was based solely on a settlement license entered five years after the hypothetical negotiation); *e.g.*, *LaserDynamics, Inc.*, 694 F.3d at 64 (criticizing use of settlement licenses in determining a reasonable royalty); *Fenner Invs., Ltd. v. Hewlett-Packard Co.*, No. 6:08-cv-273, 2010 WL 1727916, at \*2-3 (E.D. Tex. Apr. 28, 2010) (excluding settlement agreements relied on to establish reasonable royalty).

## **II. Other Challenges to Gregory Leonard**

Aside from its objections to the VIA Agreement, the Berkana Acquisition, and the WRF Agreement, Parkervision also challenges Leonard's opinions on the grounds that he: (1) failed to apply the required presumption of validity and infringement; (2) improperly assumed that Qualcomm had non-infringing alternatives in 2006; and (3) corrected Benoit's "income approach" without "endorsing" the approach. (Doc. 285, pp. 13-20.) Upon review of Leonard's Report and the cited case law, the Court rejects each of Parkervision's additional challenges to Leonard's opinions. First, Leonard acknowledged the pertinent presumptions, and his criticisms appear to go to a lack of

commercial success—not a lack of patentability. Second, there is sufficient evidence of non-infringing alternatives available in 2006 to support Leonard’s opinions. Third, there is no merit to Parkervision’s endorsement argument. Parkervision’s remaining challenges are best handled with vigorous cross-examination, presentation of contrary evidence, and appropriate instructions to the jury.

### III. Other Challenges to the Testimony of Paul Benoit<sup>7</sup>

Aside from its objection to the 1999 Documents and negotiations, Qualcomm also challenges Benoit’s use of Nash Bargaining Solution (“NBS”) to determine the appropriate “split” of incremental profit between Parkervision and Qualcomm. (Doc. 288, pp. 16-23.) According to Qualcomm, Benoit’s NBS analysis simply uses a 50/50 split to replace the 25% rule of thumb that was rejected by the Federal Circuit in *Uniloc*. (*Id.*) Further, Qualcomm contends that Benoit did not reliably apply the NBS, and he has insufficient qualifications and experience to do so. (*Id.*) Parkervision counters that the NBS has been permitted in many courts, it is a reliable methodology, and Benoit reliably applied it to the facts in this case. (Doc. 305, pp. 11-18.)

At the *Daubert* Hearing, little time was spent on the NBS arguments. Indeed, Parkervision expressed relief that “no one asked [Benoit] about it . . . because . . . it can get to be pretty heavy sledding.” (Doc. 375, p. 71.) Further, a review of Benoit’s NBS explanation and analysis indicate that he may have treated the paradigm as an impermissible default starting point:

Proper application of the [*Georgia-Pacific* Factors] yields the benefits sought under the NBS framework, which results in a *starting point for negotiation of a 50/50 split between licensor and licensee*, recognizing that

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<sup>7</sup> The Court rejects Qualcomm’s argument that Parkervision has waived its contributory infringement claim. Benoit’s opinions concerning indirect infringement are sufficient to preserve Parkervision’s claim for damages.

qualitative considerations that are not quantified under the [*Georgia-Pacific* analysis] may serve to tilt the benefits in favor of either the licensor or licensee. . . .

\* \* \*

The [\$\_\_\_\_\_] per receiver and [\$\_\_\_\_\_] per transceiver quantified under [Georgia Pacific Factor Six through Thirteen] in this report represents the benefits *to be split equally between the licensor and licensee in accordance with the NBS*. On balance, the qualitative considerations do not suggest a material shift of benefit to either the licensor or the licensee.

(Doc. 305, Ex. 1, ¶¶ 243-45 (emphasis added).)

At this point, Court has reservations about Benoit's use of the admittedly "complex" NBS (Doc. 375, p. 71), and the Court therefore cannot find that Parkervision has met its burden to establish by a preponderance of the evidence that Benoit's use of the NBS satisfies the requirements of Rule 702 and *Daubert*. *Oracle Am., Inc. v. Google Inc.*, 798 F. Supp. 2d 1111, 1120 (N.D. Cal. 2011) (rejecting the NBS under *Uniloc* because it was confusing and "cloth[ed] a fifty-percent assumption in an impenetrable façade of mathematics"); *Suffolk Techs. LLC v. AOL Inc.*, No. 1:12-cv-625, 2013 U.S. Dist. LEXIS 64630, at \*5-\*6 (E.D. Va. Apr. 12, 2013) (rejecting NBS damages opinion as indistinguishable "from the damages opinion rejected in *Uniloc*"); *e.g.*, *Dynetix Design Solutions, Inc. v. Synopsys, Inc.*, No. C-11-05973, 2013 WL 4538210, at \*5 (N.D. Cal. Aug. 22, 2013) (excluding expert testimony basing a hypothetical royalty rate on a fifty percent split). Rather than preclude Benoit's reliance on the NBS, the Court will provide Parkervision with an additional opportunity to satisfy its burden of proof. This is the best course of action, particularly given the Court's ruling as to Benoit's reliance on the 1999 Documents and negotiations.

## CONCLUSION

Accordingly, it is hereby **ORDERED AND ADJUDGED**:

1. Parkervision's Daubert Motion to Exclude Portions of the Expert Report

and Testimony of Gregory Leonard and Behzad Razavi (Doc. 285) is **GRANTED IN PART AND DENIED IN PART**. The Motion is **GRANTED** with respect to Gregory Leonard's reliance on the WRF Agreement and the Berkana Acquisition, and in all other respects is **DENIED**.

2. Qualcomm's Daubert Motion to Exclude Paul Benoit's Damages Testimony and Memorandum in Support (Doc. 288) is **GRANTED IN PART AND IS DENIED IN PART**. The Motion is **GRANTED** with respect to Paul Benoit's reliance on the 1999 Documents and negotiations, is **DENIED WITHOUT PREJUDICE** as to the Nash Bargaining Solution challenge, and in all other respects is **DENIED**.

**DONE AND ORDERED** in Chambers in Jacksonville, Florida, on October 11, 2013.

  
\_\_\_\_\_  
ROY B. DALTON JR.  
United States District Judge

Copies:

Counsel of Record

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF FLORIDA  
JACKSONVILLE DIVISION**

PARKERVISION, INC.,

Plaintiff,

v.

Case No. 3:11-cv-719-RBD-TEM

QUALCOMM INCORPORATED,

Defendant.

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**ORDER**

This matter comes before the Court on the following matters:

1. The Motion to Phase Trial Proceedings filed by Defendant Qualcomm Incorporated (Doc. 322) filed August 29, 2013;
2. The Response to Defendant's Motion to Phase Trial Proceedings filed by Plaintiff Parkervision, Inc. (Doc. 347) filed September 16, 2013;
3. The Motions in Limine filed by Defendant Qualcomm Incorporated (Doc. 325) filed August 29, 2013;
4. The Response to Defendant's Motions in Limine filed by Plaintiff Parkervision, Inc. (Doc. 345) filed September. 16, 2013;
5. The Opposed Motion for Rule 37 Sanctions and Motions in Limine filed by Plaintiff Parkervision, Inc. (Doc. 323) filed August 29, 2013; and
6. The Response to Plaintiff's Opposed Motion for Rule 37 Sanctions and Motions in Limine filed by Defendant Qualcomm Incorporated (Doc. 348) filed September. 16, 2013.

## INTRODUCTION

On September 19, 2013, the Court held a Pretrial Conference (the “PTC”). At the PTC, the parties withdrew certain Motions in Limine and offered argument concerning others. (Docs. 360, 365.) The parties also presented argument concerning Defendant’s Motion to Phase Trial Proceedings. Based on the written submissions and the parties’ arguments and representations at the PTC, the Court ruled on the pending motions as set forth below.

## THE MOTION TO PHASE TRIAL

The Court **Granted in Part and Denied in Part** the Motion to Phase Trial Proceedings filed by Defendant Qualcomm Incorporated (the “Motion to Phase”). (Doc. No. 365 pp. 15-16, 22.) The Motion to Phase is **denied** to the extent that Qualcomm requested that the issues of indirect infringement be tried separately from direct infringement. The Motion to Phase is **granted** to the extent that Qualcomm requested that the issues of willful infringement and damages be tried in a separate phase from the issues of validity and direct and indirect infringement.

One trial will be held in this matter before a single jury, but the trial will be divided into two phases. In the first phase, the parties will present the issues of validity and direct and indirect infringement to the jury. After the jury renders a verdict in the first phase, then, if necessary, the trial will proceed to the second phase. In the second phase, the parties will present the issues of damages and willfulness. The Court will instruct the jury that it may consider evidence presented in phase one to resolve the matters presented to them in phase two. Each side will be given a total of twenty hours for both phases to present their respective cases – not counting forty-five minutes per side for opening statements and forty-five minutes per side for closing statements.



## THE MOTIONS IN LIMINE (“MIL”)

### 1. Qualcomm’s Motions in Limine

#### A. MIL 1

The Court **Reserved Ruling** on Qualcomm’s MIL 1 (Doc. 365, pp. 23-24 & 30-31).

#### B. MIL 2

The Court **Denied as Moot** Qualcomm’s MIL 2 (*Id.* at p. 52).

#### C. MIL 3

The Court **Denied as Moot** Qualcomm’s MIL 3 (*Id.* at pp.52-54).

#### D. MIL 4

The Court **Denied as Moot** Qualcomm’s MIL 4 (*Id.* at pp. 57).

#### E. MIL 5

The Court **Denied as Moot** Qualcomm’s MIL 5 (*Id.* at p. 81).

#### F. MIL 6

The Court **Reserved Ruling** on Qualcomm’s MIL 6 (*Id.* at p. 82).

#### G. MIL 7

The Court **Denied** Qualcomm’s MIL 7 (*Id.* at pp. 57-58).

#### H. MIL 8

The Court **Denied as Moot** Qualcomm’s MIL 8 (*Id.* at p. 81).

#### I. MIL 9

The Court **Denied as Moot** Qualcomm’s MIL 9 (*Id.* at p. 57).

#### J. MIL 10

The Court **Reserved Ruling** on Qualcomm’s MIL 10 (*Id.*).

#### K. MIL 11

The Court **Denied as Moot** Qualcomm’s MIL 11 (*Id.* at pp. 58).

#### L. MIL Number Twelve

The Court **Denied as Moot** Qualcomm's MIL 12 (*Id.* at p. 82).

## **2. Parkervision's Motions in Limine**

### **A. MIL A.1**

The Court **Denied as Moot** Parkervision's MIL A.1 (*Id.* at p. 59).

### **B. MIL A.2**

The Court **Reserved Ruling** on Parkervision's MIL A.2 (*Id.* at p. 59).

### **C. MIL A.3**

The Court **Denied as Moot** Parkervision's MIL A.3 (*Id.* at pp. 60-61).

### **D. MIL A.4**

The Court **Denied as Moot** Parkervision's MIL A.4 (*Id.* at p. 61).

### **E. MIL B.1**

The Court **Denied as Moot** Parkervision's MIL B.1 (*Id.* at p. 83).

### **F. MIL C.1**

The Court **Granted** Parkervision's MIL C.1 as it relates to the tutorial testimony from Mr. Sorrells and Mr. Fox (*Id.* at p. 63-64).

### **G. MIL D.1**

The Court **Denied as Moot** Parkervision's MIL D.1 (*Id.*).

### **H. MIL D.2**

The Court **Reserved Ruling** on Parkervision's MIL D.2 (*Id.* at pp. 65, 105-106).

### **I. MIL E.1**

The Court **Reserved Ruling** on Parkervision's MIL E.1 (*Id.* at pp. 65-67, 71-72).

### **J. MIL F.1**

The Court **Granted Without Prejudice** Parkervision's MIL F.1 (*Id.* at p. 72, 75).

### **K. MIL G.1**

The Court **Reserved Ruling** on Parkervision's MIL G.1 (*Id.* at p. 76-77).

### **L. MIL H.1**

The Court **Reserved Ruling** on Parkervision's MIL H.1 (*Id.* at pp. 79).



## CONCLUSION

Accordingly, it is hereby **ORDERED AND ADJUDGED**:

1. The Motion to Phase Trial Proceedings filed by Defendant Qualcomm Incorporated (Doc. 322) is **DENIED IN PART AND GRANTED IN PART**;
2. The Motions in Limine filed by Defendant Qualcomm Incorporated (Doc. 325) are **DENIED IN PART, GRANTED IN PART, and RULING IS RESERVED IN PART**; and
3. The Opposed Motion for Rule 37 Sanctions and Motions in Limine filed by Plaintiff Parkervision, Inc. (Doc. 323) are **DENIED IN PART, GRANTED IN PART, and RULING IS RESERVED IN PART**.

**DONE AND ORDERED** in Chambers in Jacksonville, Florida, on September 27, 2013.

  
\_\_\_\_\_  
ROY B. DALTON JR.  
United States District Judge

Copies:

Counsel of Record



4. Qualcomm's Reply Memorandum in Support of Its Motion for Partial Summary Judgment (Doc. 294), filed July 11, 2013; and
5. Exhibit 9 to Qualcomm's Reply Memorandum in Support of Its Motion for Partial Summary Judgment (Doc. 294), filed July 11, 2013.

### **BACKGROUND**

ParkerVision contends that Qualcomm infringes, either directly or indirectly, the claims of U.S. Patent No. 6,061,551 ("the '551 Patent"), U.S. Patent No. 6,266,518 ("the '518 Patent"), U.S. Patent No. 6,370,371 ("the '371 Patent"), U.S. Patent No. 6,963,734 ("the '734 Patent"), U.S. Patent No. 7,496,342 ("the '342 Patent"), and U.S. Patent No. 7,724,845 ("the '845 Patent"). The patents-in-suit relate to methods, systems, and apparatuses used to convert electromagnetic signals from higher frequencies to lower frequencies. Such down-conversion is used, for instance, during the operation of cellular telephones and similar devices.

Qualcomm moves for summary judgment of non-infringement on ParkerVision's claims. (Doc. 270.) ParkerVision opposes the motion (Doc. 277), which is ripe for adjudication.

### **STANDARDS**

Summary judgment is appropriate where there is no genuine issue as to any material fact and the moving party is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(a). A genuine dispute of material fact exists if "the evidence is such that a reasonable jury could return a verdict for the nonmoving party." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). To defeat a motion for summary judgment, the nonmoving party must "go beyond the pleadings, and present affirmative evidence to show that a genuine issue of material fact exists." *Porter v. Ray*, 461 F.3d 1315, 1320

(11th Cir. 2006). The Court must “draw all justifiable inferences in favor of the nonmoving party, including questions of credibility and of the weight to be accorded particular evidence.” *Masson v. New Yorker Magazine, Inc.*, 501 U.S. 496, 520 (1991).

## DISCUSSION

Qualcomm seeks summary judgment that certain devices it manufactures, the Atheros Products, do not infringe the claims of the asserted patents. Qualcomm also contends that it is entitled to summary judgment on ParkerVision’s indirect infringement claims for four of the asserted patents and that its 50% Duty Cycle Products do not infringe ParkerVision’s patent claims.

### I. Non-Infringement of the Atheros Products

First, Qualcomm seeks a declaration that fifteen of its chipsets do not infringe the asserted claims.<sup>1</sup> (Doc. 270, pp. 12–14.) Qualcomm contends that these chipsets were designed and sold by a company called Atheros Communications, Inc., which Qualcomm acquired just before the commencement of this lawsuit. (*Id.* at 10.) Qualcomm offers expert testimony that these chipsets, which it calls the “Atheros Products,” do not infringe the patent claims because the products do not perform energy sampling at an aliasing rate and do not contain a storage element coupled to the down-conversion circuit. (*Id.*) ParkerVision “agrees that the summary judgment evidence does not establish infringement of the Atheros Products.” (Doc. 277, p. 20.) ParkerVision asserts that the Court should dismiss its claims of infringement rather than enter summary judgment on those claims.

ParkerVision concedes that it can offer no evidence in support of its claims that

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<sup>1</sup> These chipsets are identified as AR6002, AR6013, AR6014, AR6102, AR6122, AR9220, AR9223, AR9227, AR9271, AR9280, AR9281, AR9282, AR9283, AR9285, and AR9287. (Doc. 270-28.)

the Atheros Products infringe the claims of the asserted patents. The Court may therefore grant summary judgment. See *Anderson*, 477 U.S. at 257; see also *Walker v. Darby*, 911 F.2d 1573, 1577 (11th Cir. 1990). The Court is not inclined to dismiss these declaratory claims where the parties have expended so much time and effort in litigation. (See Doc. 294, p. 10.)

Summary judgment is therefore due to be granted in favor of Qualcomm on ParkerVision's claim of infringement and on Qualcomm's counterclaim of non-infringement as to the Atheros Products.<sup>2</sup>

## **II. Indirect Infringement**

Qualcomm also moves for summary judgment on ParkerVision's indirect infringement claims. (Doc. 270.) Qualcomm argues that it did not have pre-suit knowledge of four of ParkerVision's patents and as such, ParkerVision cannot prove its contributory or induced infringement claims. (*Id.* at 14–19.) ParkerVision responds that there is circumstantial evidence from which the trier of fact can infer that Qualcomm had pre-suit knowledge of the patents. (Doc. 277, pp. 5–8.) ParkerVision also contends that a jury could conclude from such evidence that Qualcomm was willfully blind to the existence of the patents. (*Id.* at 8–9.)

Both theories of indirect infringement require Qualcomm to know of the existence of the asserted patents prior to the commencement of the suit. See *Commil USA, LLC v. Cisco Sys., Inc.*, No. 2012-1041, 2013 WL 3185535, at \*4 (Fed. Cir. June 25, 2013) (holding that inducement requires both pre-suit knowledge of the existence of the patent

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<sup>2</sup> Qualcomm's counterclaim alleges that it "has not infringed, and currently does not infringe, any valid claim of any of the Patents-in-Suit, directly, indirectly, contributorily, by inducement, or in any other manner, and ParkerVision is entitled to no relief for any claim of alleged infringement." (Doc. 248, p. 8.)



and knowledge that the induced acts constitute patent infringement); *SynQor, Inc. v. Artesyn Techs., Inc.*, 709 F.3d 1365, 1379 (Fed. Cir. 2013) (holding that contributory infringement requires actual knowledge of the existence of the patent that is infringed). This can be proven by direct or circumstantial evidence. See *Commil USA, LLC*, 2013 WL 3185535, at \*3; *DSU Med. Corp. v. JMS Co.*, 471 F.3d 1293, 1306 (Fed. Cir. 2006); *Broadcom Corp. v. Qualcomm Inc.*, 543 F.3d 683, 699 (Fed. Cir. 2010).

ParkerVision contends that it and Qualcomm engaged in negotiations regarding its technology from 1998 until 1999. (Doc. 277, pp. 2–3.) These negotiations involved Qualcomm executives and its patent counsel, at least one of whom reviewed ParkerVision’s patent applications. (*Id.*) One Qualcomm executive concluded that, while the applications that he reviewed may have “some holes,” ParkerVision was “trying to capture every possible version of any use of their basic device.” (Doc. 276-9.) The same executive understood that ParkerVision intended to file additional patent applications and thought that it would be “very difficult for anybody to ever use” ParkerVision’s methods “without stepping on one or more of their claims.” (*Id.*) ParkerVision also contends that Qualcomm’s executives communicated with one another about ParkerVision’s patents after the issuance of the ’551 Patent and the ’371 Patent.<sup>3</sup> (*Id.* at 3–4.) ParkerVision also describes a 2004 email exchange between Qualcomm’s engineers discussing “disruptive technology” for receivers. (Doc. 276-20.) One engineer

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<sup>3</sup> The parties dispute the admissibility of this evidence. ParkerVision, however, need not “produce evidence in a form that would be admissible at trial in order to avoid summary judgment.” *Celotex Corp. v. Catrett*, 477 U.S. 317, 325 (1986). A court may consider evidence in an inadmissible form on summary judgment so long as such evidence can be reduced to admissible evidence at trial. See *Rowell v. BellSouth Corp.*, 433 F.3d 794, 800 (11th Cir. 2005); see also *Macuba v. Deboer*, 193 F.3d 1316, 1324–25 (11th Cir. 1999) (holding that otherwise admissible evidence can be submitted in inadmissible form on summary judgment).

thought that it “would be a great idea to explore the idea of RF sampling for a low dynamic range receiver,” to which the other responded that he would set up a meeting to “go over [the] ParkerVision approach” to “see if we can make it work.” (*Id.*) This proffer is sufficient to raise a genuine dispute of a material fact as to whether Qualcomm had actual knowledge of ParkerVision’s patents and whether it was willfully blind to the existence of those patents.

Accordingly, Qualcomm’s motion is due to be denied as to this issue.

### **III. Non-Infringement of the 50% Duty Cycle Products**

Finally, Qualcomm seeks summary judgment on its claims that some of its products, which it calls the “50% Duty Cycle Products,” do not infringe the claims of ParkerVision’s patents. (Doc. 270, pp. 20–25.) Qualcomm argues that its 50% Duty Cycle Products, which consist of two switches connected to a capacitor, work in such a way that the capacitor is always charging. (*Id.* at 22–25.) This occurs because when one of the switches is closed, the other switch is open. (*Id.*) Each switch provides charge to the capacitor only when it is closed. (*Id.*) Each switch is closed about half of the time and therefore provides charge to the capacitor only about half of the time. (*Id.*) The capacitor, however, is being charged the whole time because one of the switches is always closed. (*Id.*)

Qualcomm argues that the opinions of ParkerVision’s expert Dr. Prucnal concerning “energy sampling” require the discharging of energy that has been transferred and accumulated in a storage device such as a capacitor. (*Id.* at 20–21.) Qualcomm states that Dr. Prucnal also opines that a storage device discharges when the switch connected to it is open—that is, when it is not charging. (*Id.*) Because its 50% Duty Cycle Products are always charging, Qualcomm argues that its products do not

discharge and therefore do not infringe the claims of ParkerVision's patents. (*Id.*) Qualcomm contends that Dr. Prucnal admitted that this is the case. (*Id.* at 22–23.)

In response, ParkerVision argues that Qualcomm overlooks several important aspects of Dr. Prucnal's testimony. (Doc. 277, pp. 12–14.) ParkerVision contends that Dr. Prucnal was discussing a hypothetical "ideal" 50% duty cycle product when he made the statement that Qualcomm argues is an admission. (*Id.*) ParkerVision disputes Qualcomm's characterization of Dr. Prucnal's testimony and disputes whether Qualcomm's products actually operate at a 50% duty cycle. (*Id.*)

Dr. Prucnal was asked at his deposition if the capacitors in Qualcomm's products had a discharge cycle in view of the fact that the capacitor was always charging. He testified as follows:

Q: Right. So neither of those to [sic] capacitors ever has a discharge cycle because it is always receiving input current, correct?

A: I don't—I don't think that is necessarily correct. It is charging alternately from two different signals and it has a discharge path from there.

(Doc. 276-23, Prucnal Dep. 222:10–15.) The testimony continues:

Q: Okay. And there being one of the two of them is always being directed to each of those two capacitors, right?

A: You're saying that one of the two of them is always being directed to one of the two capacitors.

Q: Yeah.

A: I believe that's correct.

Q: So there is no discharge cycle on either of those capacitors, right?

[Objection]

A: As I said, I don't agree with that because it's going to depend upon the impedance scene looking forward in this circuit where charging

the capacitor and then energy is being transferred into it from one or the other of these two LOI+—I am sorry—ILNA+ or ILNA- but then that has the opportunity to discharge as well.

(*Id.* at 223:8–24.) This testimony, as well as Dr. Prucnal’s other testimony, make clear that he does not agree with Qualcomm’s theory of how the 50% Duty Cycle Products operate and how they satisfy the elements of the claims. Qualcomm focuses on the presence and absence of discrete charging and discharging cycles. Dr. Prucnal’s theory, on the other hand, requires the accumulated energy to be discharged but does not necessarily require discrete charging and discharging cycles.<sup>4</sup>

Given this disagreement among the parties’ experts, ParkerVision has put forth sufficient evidence to raise a genuine dispute of material fact regarding the infringement of Qualcomm’s 50% Duty Cycle Products.<sup>5</sup> Qualcomm’s motion for summary judgment as to this issue is therefore due be denied.

### CONCLUSION

Accordingly, it is hereby **ORDERED AND ADJUDGED**:

1. Qualcomm’s Motion for Partial Summary Judgment (Doc. 270) is **GRANTED IN PART** and **DENIED IN PART**, as set forth in this Order.
2. Summary judgment is **GRANTED** in favor of Qualcomm and against ParkerVision on Qualcomm’s counterclaims that the Atheros Products do not infringe any claim of U.S. Patent Nos. 6,061,551; 6,266,518; 6,370,371; 6,963,734; 7,496,342; and 7,724,845. ParkerVision shall take

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<sup>4</sup> The parties made similar arguments during the construction of the claim limitations.

<sup>5</sup> Qualcomm’s remaining arguments concern points that relate more to the weight that should be given to Dr. Prucnal’s opinions by the trier of fact than an absence of opinion regarding infringement, especially in view of Dr. Prucnal’s expert report which expressly notes how Qualcomm’s products satisfy the limitations of the asserted claims.

nothing on its claim of infringement as to the Atheros Products.

**DONE AND ORDERED** in Chambers in Jacksonville, Florida, on August 26, 2013.

  
\_\_\_\_\_  
ROY B. DALTON JR.  
United States District Judge

Copies:

Counsel of Record

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF FLORIDA  
JACKSONVILLE DIVISION**

PARKERVISION, INC.,

Plaintiff,

vs.

QUALCOMM INCORPORATED,

Defendant.

Case No. 3:11-cv-719-J-37TEM

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QUALCOMM INCORPORATED,

Counterclaim Plaintiff,

vs.

PARKERVISION, INC.; and STERNE,  
KESSLER, GOLDSTEIN & FOX PLLC,

Counterclaim Defendants.

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**ORDER**

This cause is before the Court on the following:

1. ParkerVision's Motion for Summary Judgment of No Invalidity (Doc. 269), filed May 22, 2013;
2. Qualcomm's Opposition to ParkerVision's Motion for Summary Judgment of No Invalidity (Doc. 275), filed June 24, 2013;
3. ParkerVision's Reply to Qualcomm's Opposition to ParkerVision's Motion for Summary Judgment of No Invalidity (Doc. 295), filed July 11, 2013; and
4. Declaration of Mario A. Apreotesi in Support of ParkerVision's Motion for

Summary Judgment of No Invalidity (Doc. 296), filed July 11, 2013.

## **BACKGROUND**

ParkerVision contends that Qualcomm infringes, either directly or indirectly, the claims of U.S. Patent No. 6,061,551 (“the ’551 Patent”), U.S. Patent No. 6,266,518 (“the ’518 Patent”), U.S. Patent No. 6,370,371 (“the ’371 Patent”), U.S. Patent No. 6,963,734 (“the ’734 Patent”), U.S. Patent No. 7,496,342 (“the ’342 Patent”), and U.S. Patent No. 7,724,845 (“the ’845 Patent”). The patents-in-suit relate to methods, systems, and apparatuses used to convert electromagnetic signals from higher frequencies to lower frequencies. Such down-conversion is used, for instance, during the operation of cellular telephones and similar devices.

Qualcomm contends that the claims of these patents are invalid. (Doc. 248.) At the close of discovery, ParkerVision moved for summary judgment on Qualcomm’s invalidity counterclaims. (Doc. 269.) The motion is now ripe for adjudication.

## **STANDARDS**

Summary judgment is appropriate where there is no genuine issue as to any material fact and the moving party is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(a). A genuine dispute of material fact exists if “the evidence is such that a reasonable jury could return a verdict for the nonmoving party.” *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). To defeat a motion for summary judgment, the nonmoving party must “go beyond the pleadings, and present affirmative evidence to show that a genuine issue of material fact exists.” *Porter v. Ray*, 461 F.3d 1315, 1320 (11th Cir. 2006). The Court must “draw all justifiable inferences in favor of the nonmoving party, including questions of credibility and of the weight to be accorded particular evidence.” *Masson v. New Yorker Magazine, Inc.*, 501 U.S. 496, 520 (1991).

## DISCUSSION

ParkerVision seeks summary judgment on Qualcomm's anticipation and obviousness invalidity counterclaims, on Qualcomm's theory that the claims are not enabled, on the definiteness of several claim terms, and on the general allegations in Qualcomm's counterclaims that the claims are invalid under numerous provision of the Patent Act.

### I. Anticipation and Obviousness

ParkerVision's motion for summary judgment on Qualcomm's anticipation and obviousness counterclaims rests on the Court rejecting the invalidity opinions of Qualcomm's expert, Dr. Behzad Razavi. ParkerVision contends that Dr. Razavi failed to offer any opinion or set forth any evidence establishing that any prior art reference meets the generating limitation of each asserted claim of the '551 Patent, the '518 Patent, and the '371 Patent. (Doc. 269, pp. 6–17.) Each asserted claim of these patents contains, among other things, a transferring limitation and a generating limitation. (*Id.* at 7.) ParkerVision contends that Dr. Razavi conflates and confuses these two limitations because he concludes that the transferring limitation and the generating limitation are necessarily satisfied during the operation of certain circuitry known in the art. (*Id.* at 8–9.) Dr. Razavi reasons that this is so because the generating limitation “can happen simultaneously with the transferring of energy from the carrier signal.” (*Id.*)

Qualcomm argues in response that Dr. Razavi did not conflate the transfer limitation and a generating limitation of the asserted claims. (Doc. 275, pp. 9–11.) His analysis, according to Qualcomm, merely rests on fundamental principles of physics and the understanding that the transferring and generating limitations of the claims can occur simultaneously. (*Id.*) Qualcomm also argues that ParkerVision's theory—that the



lower frequency signal is generated from the discharge path of a capacitor or storage device—is not supported by the claim language. (*Id.* at 15–17.)

In reply, ParkerVision contends that “the plain and ordinary meaning of ‘generating’ a lower frequency signal ‘from the transferred energy’ requires the discharge of energy from a storage device.” (Doc. 295, pp. 4–6.) It points to portions of the specification that teach the discharging of a storage device to generate the lower frequency signal, as well as portions of the specification that teach the sawtooth-like voltage waveform which demonstrates that a lower frequency signal has been generated. (*Id.*)

The Federal Circuit instructs that anticipation, “though a question of fact, may be resolved on summary judgment if no genuine issue of material fact exists.” *OSRAM Sylvania, Inc. v. Am. Induction Techs., Inc.*, 701 F.3d 698, 704 (Fed. Cir. 2012). “Similarly, ‘a district court can properly grant, as a matter of law, a motion for summary judgment on patent invalidity when the factual inquiries into obviousness present no genuine issue of material facts.’” *Id.* (quoting *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 716 (Fed. Cir. 1991)).

Claim 1 of the '551 Patent claims:

A method for down-converting a carrier signal to a lower frequency signal, comprising the steps of:

- (1) receiving a carrier signal;
- (2) transferring non-negligible amounts of energy from the carrier signal, at an aliasing rate that is substantially equal to a frequency of the carrier signal plus or minus frequency of the lower frequency signal, divided by  $n$ , where  $n$  represents a harmonic or sub-harmonic of the carrier signal; and
- (3) generating a lower frequency signal from the

transferred energy.

Qualcomm's position is that the language of the claim requires only (1) the "transfer of energy from the carrier signal" and (2) the generation of a "lower frequency signal from the transferred energy." In other words, "[t]he claims at-issue in this motion require only that the signal be generated; they have no discharge requirement." (Doc. 275, p. 15.) ParkerVision's position by contrast rests on its theory that these two claim limitations together define the inventions disclosed in the '551 Patent, the '518 Patent, and the '371 Patent—namely that the lower frequency signal is generated by "discharging the transferred energy from [a] storage device." (Doc. 269, p. 11.)

Qualcomm has the better argument. First, the Court adopted ParkerVision's claim construction position that the generating limitation was clear enough that it need not be defined. ParkerVision cannot adopt a new position now. If, as ParkerVision now contends, the generating limitation is restricted to those devices and methods that discharge the transferred energy from a storage device, then it is not apparent to the Court why ParkerVision opposed the majority of Qualcomm's proposed claim constructions, which attempted to limited the scope of the claims to methods and devices that used storage devices such as capacitors.

Second, the transferring limitation of claim 1 of the '551 Patent contains no language that requires the use of a storage device. Rather, it requires merely the "transferring non-negligible amounts of energy from the carrier signal" at a specified rate. Dr. Razavi contends that down-conversion using an aliasing rate can be accomplished by a simple switch, the opening and closing of which would cause non-negligible amounts of energy to transfer from a carrier signal to a lower frequency signal. This testimony is sufficient to create a material issue of fact as to the transferring

limitation.

Likewise, the generating limitation does not describe the generating step as being performed by the discharge of a storage device. To be sure, the scope of the generating limitation embraces ParkerVision's discharge theory, which is described in detail in the patent specifications, but the language used is not so restricted. It claims simply "generating . . . from the transferred energy." It is apparent from the briefing and patent specifications that a signal could be "generated" from a charge held in a capacitor either directly, by discharging the capacitor, or indirectly, by measuring the voltage across the capacitor. The language used in the generating claim limitation does not distinguish between these two techniques. One skilled in the art who reads the disclosure may conclude that the various elements of the claims combine to restrict the claimed invention to the former rather than the latter. ParkerVision's motion, however, rests on the satisfaction of the generating limitation. The parties' experts disagree if the generating limitation is disclosed in the prior art, which is all that is required to deny the motion.

Accordingly, because Qualcomm has identified genuine disputes of material fact, ParkerVision's summary judgment motion is due to be denied with regard to Qualcomm's anticipation and obviousness counterclaims.

## **II. Enablement**

ParkerVision seeks summary judgment on Qualcomm's counterclaim that the claims of the '551 Patent, the '518 Patent, and the '371 Patent are invalid under 35 U.S.C. § 112 for lack of enablement. (Doc. 269, pp. 17–19.) ParkerVision contends that the only evidence Qualcomm has advanced in support of its enablement challenge are the opinions of Dr. Razavi. (*Id.*) ParkerVision argues that Dr. Razavi's opinions are

based on an incorrect understanding of the law of enablement and a flawed analysis of one embodiment of the claimed invention. (*Id.*) Qualcomm responds that Dr. Razavi merely demonstrated that the invention is not capable of distinguishing the signal from noise and interference throughout the scope of the claims. (Doc. 275, pp. 18–19.)

Enablement is a legal determination of whether a patent enables one skilled in the art to make and use the claimed invention. *BJ Servs. Co. v. Halliburton Energy Servs., Inc.*, 338 F.3d 1368, 1371 (Fed. Cir. 2003). A specification is enabling even if one skilled in the art would be required to perform some experimentation so long as the experimentation is not unduly extensive. *Id.* The enablement requirement applies to the invention as claimed. A patent applicant who obtains broad claims must be prepared to defend the proposition that the full scope of those claims has been enabled. *Auto. Techs. Int'l, Inc. v. BMW of N. Am., Inc.*, 501 F.3d 1274, 1282–83 (Fed. Cir. 2007). While enablement is a question of law, it may rest on factual determinations that should be decided by the jury. *BJ Servs. Co.*, 338 F.3d at 1371.

The issue of enablement in this case rests on factual issues amenable to resolution by the jury. See, e.g., *Streck, Inc. v. Research & Diagnostic Sys., Inc.*, 665 F.3d 1269, 1288 (Fed. Cir. 2012) (noting that determining whether undue experimentation is required “is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations.”) Dr. Razavi’s demonstration tends to show that the methods disclosed in the patents cannot transfer non-negligible amounts of energy in amounts that are distinguishable from noise throughout the entire scope of the claims. Qualcomm has therefore brought some evidence that the claims are not enabled. ParkerVision’s argument in response raises a question of fact—whether the experimentation required to enable the invention

throughout the scope of the claims is unduly extensive. *See id.*

ParkerVision's motion for summary judgment on Qualcomm's enablement challenge is therefore due to be denied.

### **III. Indefiniteness**

ParkerVision asks the Court to grant summary judgment to it on Qualcomm's indefiniteness counterclaims. (Doc. 269, pp. 19–24.) Qualcomm contends that some claim terms are indefinite words of degree. It also contends that certain claims are invalid because they have mathematical formulas that contain typographical errors. The Court considers each argument in turn.

#### **A. Words of Degree**

Qualcomm contends that claims 113, 161, 202, and 203 of the '551 Patent, claims 4 and 7 of the '845 Patent, and claims 81 and 91 of the '518 Patent are invalid as indefinite because of the use of the terms “substantial” and “accurate.” (*Id.* at 19–22.) ParkerVision argues that, in the context of the claims, the meanings of these terms are readily apparent. (*Id.*) Qualcomm argues in response that these terms are indefinite because these terms are words of degree for which the specification must, but does not, provide an objective standard. (Doc. 275, pp. 19–20.)

Indefiniteness is a legal determination that “focuses on whether those skilled in the art would understand the scope of the claim when the claim is read in light of the specification.” *BJ Servs. Co.*, 338 F.3d at 1372. Though a question of law, if underlying factual findings are necessary to resolve a dispute, then the indefiniteness question is amenable to resolution by the jury. *Id.* If the patent claims use less than precise terms—which are sometimes called words of degree—then the Court must determine whether the specification provides some guidance for measuring that degree. *Seattle Box Co. v.*

*Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984). Put another way, when confronted with a word of degree a court must ask, “Would an expert know the limitations imposed by the claims?” *Id.*

Here, the issue of indefiniteness turns on the disclosure found in the patents’ specifications and the knowledge of those skilled in the art. Dr. Razavi opines that specifications do not provide any standards for measuring the terms substantial and accurate. (Doc. 269, p. 21.) He states in his expert report that he reviewed the specification and claims in this case and determined that they do not provide any guidance as to what constitutes “substantial amounts of energy” and what is meant by “accurate voltage reproduction.” Dr. Razavi, who worked as an engineer designing integrated circuits for communication systems during the 1990s before turning to teaching, is familiar with the level of knowledge of one skilled in the art during the relevant time period. (Doc. 269-1.) His testimony is sufficient to raise a material issue of fact that should be resolved by the jury.

## **B. Typographical Errors**

ParkerVision also seeks summary judgment on Qualcomm’s counterclaim that claims 4 and 7 of the ’845 Patent are indefinite because they contain typographical errors. (*Id.* at 22–24.) Those errors are present in mathematical formulas that specify, in claim 4, a mathematical transformation that must be applied to the carrier signal in one step of the methods claims and, in claim 7, describe mathematically the accumulation of energy. (*Id.*) ParkerVision proposes corrections to the formulas. (*Id.*) Qualcomm opposes, arguing that ParkerVision’s proposed fixes are not clear from the face of the patent and, in any event, would introduce additional error. (Doc. 275, p. 17–18.)

The Federal Circuit has held that district courts may “correct obvious minor

typographical and clerical errors in patents.” *Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1357 (Fed. Cir. 2003). Major errors in patents can only be corrected by the U.S. Patent and Trademark Office pursuant to a request under 35 U.S.C. § 254 or 35 U.S.C. § 255. *Id.* A minor error can be corrected by a district court “only if (1) the correction is not subject to reasonable debate based on consideration of the claim language and the specification and (2) the prosecution history does not suggest a different interpretation of the claims.” *Id.*

The corrections proposed by ParkerVision are not minor. The mathematical formulas are a central feature of their respective dependent claims—they *are* the reason for those claims. The formulas are supposed to define the precise way in which the carrier signal is to be transformed and how energy is to be accumulated in particular steps of the claimed methods in contrast to the broader, word-based limitations used in independent claims. The errors in the formulas are not so obvious as to have been apparent to the patentees or their patent attorneys during the prosecution of the patents. And the errors require a person with a technical background to work through a substantial specification in order to reach the corrections proposed by ParkerVision. The Court therefore finds that the errors in claim 4 and claim 7 of the ’845 Patent are not so minor as to be amendable to correction by a district court. Such claims are indefinite until such a time as they are corrected by the U.S. Patent and Trademark Office pursuant to 35 U.S.C. § 254 or 35 U.S.C. § 255.

\* \* \* \* \*

ParkerVision’s motion for summary judgment on these issues is therefore due to be denied. The Court will grant summary judgment in favor of Qualcomm on its counterclaim that claim 4 and claim 7 of the ’845 Patent are indefinite.

#### IV. Qualcomm's Remaining Invalidity Allegations

ParkerVision seeks summary judgment on Qualcomm's invalidity counterclaims that: (1) the asserted claims fail to comply with the written description requirement of 35 U.S.C. § 112; (2) the asserted claims are not patentable subject matter or violate the prohibition on double patenting under 35 U.S.C. § 101; (3) the asserted claims were abandoned, or were the subject of a prior foreign filing, or were derived from another under 35 U.S.C. § 102; and (4) the specifications fail to disclose the best mode as required by 35 U.S.C. § 112. (Doc. 269, pp. 24–25.) Qualcomm responds that, although it does allege that each “claim of the Patents-in-Suit is invalid for failure to comply with one or more provisions of 35 U.S.C. §§ 101, 102, 103, and 112” in its counterclaims (see Doc. 248, ¶ 12), it limited its invalidity attacks to specific defenses to the claims asserted by ParkerVision. (Doc. 275, p. 20.) Qualcomm then explains that because of this “defenses which might have arisen within the scope of these counterclaims were never raised, and thus there is nothing to grant summary judgment against.” (*Id.*)

Qualcomm is mistaken when it argues that there is nothing to grant summary judgment against. The allegations contained in its counterclaims broadly attack the validity of the patent claims. ParkerVision is entitled to seek summary judgment on “each claim or defense” or “part of each claim or defense” that has been asserted against it. Fed. R. Civ. P. 56(a). The moving party bears the initial burden of stating the basis for its motion and identifying those portions of the record that demonstrate the absence of genuine issues of material fact. *Celotex Corp. v. Catrett*, 477 U.S. 317, 323 (1986); *Hickson Corp. v. N. Crossarm Co.*, 357 F.3d 1256, 1259–60 (11th Cir. 2004). That burden can be discharged if the moving party can show the court that there is “an absence of evidence to support the nonmoving party's case.” *Celotex Corp.*, 477 U.S. at



325. ParkerVision, as the moving party, has discharged its burden by identifying specific invalidity claims raised by Qualcomm in its pleadings for which there is an absence of evidence.

The nonmoving party must come forward with affirmative evidence to support its claims.<sup>1</sup> *Anderson*, 477 U.S. at 257. “A mere ‘scintilla’ of evidence supporting the opposing party’s position will not suffice; there must be enough of a showing that the jury could reasonably find for that party.” *Walker v. Darby*, 911 F.2d 1573, 1577 (11th Cir. 1990). Qualcomm has offered no evidence whatsoever in support of the allegations of the counterclaims identified by ParkerVision. Qualcomm has therefore failed to support its position on an issue for which it bears the burden of proof at trial. In these circumstances, “summary judgment may be granted.” *Anderson*, 477 U.S. at 249–50.

The Court therefore finds summary judgment is due to be granted in favor of ParkerVision on Qualcomm’s counterclaims that: (1) the asserted claims fail to comply with the written description requirement of 35 U.S.C. § 112; (2) the asserted claims are not patentable subject matter or violate the prohibition on double patenting under 35 U.S.C. § 101; (3) the asserted claims were abandoned, or were the subject of a prior foreign filing, or were derived from another under 35 U.S.C. § 102; and (4) the specifications fail to disclose the best mode as required by 35 U.S.C. § 112.

### CONCLUSION

Accordingly, it is hereby **ORDERED AND ADJUDGED** that:

1. ParkerVision’s Motion for Summary Judgment of No Invalidity (Doc. 269) is **GRANTED IN PART** and **DENIED IN PART**, as discussed in this Order;

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<sup>1</sup> There is no question that Qualcomm has been afforded ample opportunity to discover the existence of any evidence in support of its invalidity counterclaims.

and

2. Summary judgment is **GRANTED** against ParkerVision and in favor of Qualcomm on Qualcomm's counterclaim that claim 4 and claim 7 of the '845 Patent are indefinite under 35 U.S.C. § 112.

**DONE AND ORDERED** in Chambers in Jacksonville, Florida, on August 25, 2013.

  
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ROY B. DALTON JR.  
United States District Judge

Copies:

counsel of record

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF FLORIDA  
JACKSONVILLE DIVISION**

PARKERVISION, INC.,

Plaintiff,

vs.

QUALCOMM INCORPORATED,

Defendant.

Case No. 3:11-cv-719-J-37TEM

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QUALCOMM INCORPORATED,

Counterclaim Plaintiff,

vs.

PARKERVISION, INC.; and STERNE,  
KESSLER, GOLDSTEIN & FOX PLLC,

Counterclaim Defendants.

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**ORDER**

This cause is before the Court on the construction of forty-four terms that appear in eighty-nine claims of six U.S. patents.

**BACKGROUND**

ParkerVision contends that Qualcomm infringes, either directly or indirectly, the claims of U.S. Patent No. 6,061,551 ("the '551 Patent"), U.S. Patent No. 6,266,518 ("the '518 Patent"), U.S. Patent No. 6,370,371 ("the '371 Patent"), U.S. Patent No. 6,963,734 ("the '734 Patent"), U.S. Patent No. 7,496,342 ("the '342 Patent"), and U.S. Patent No. 7,724,845 ("the '845 Patent"). The patents-in-suit relate to methods, systems, and apparatuses used to convert electromagnetic signals from higher frequencies to lower

frequencies. Such down-conversion is used, for instance, in the operation of cellular telephones and similar devices.

The parties have requested pretrial claim construction by the Court. The parties presented a non-adversarial tutorial on the technology on July 24, 2012 (Doc. No. 146, July 24, 2012 Hr'g Tr.); submitted two joint statements (Doc. Nos. 110, 114); filed opening and closing briefs together with documents in support (Doc. Nos. 119, 120, 121, 122, 136, 137, 138, 139); and presented arguments at a claim construction hearing (Doc. No. 163, Aug. 8, 2012 Hr'g Tr.). The Court also appointed a technical advisor, Richard Egan of O'Keefe, Egan, Peterman & Enders, LLP. (Doc. No. 162.)

The Court now turns to the construction of the disputed claim terms.<sup>1</sup>

### STANDARDS

Claim construction is a matter of law. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1330 (Fed. Cir. 2005) (en banc). The Federal Circuit directs district courts construing claim terms to focus on intrinsic evidence—that is, the claims, specification, and prosecution histories—because intrinsic evidence is “the most significant source of the legally operative meaning of disputed claim language.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996). Claim terms must be interpreted from the perspective of one of ordinary skill in the relevant art at the time of the invention. *Phillips*, 415 F.3d at 1313.

Claim construction starts with the claims, *id.* at 1312, and remains centered on the words of the claims throughout, *Interactive Gift Express, Inc. v. CompuServe, Inc.*,

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<sup>1</sup> The parties have agreed to the construction of a number of claim limitations (see Doc. No. 141, pp. 11–12; Doc. No. 137, p. 20), which the Court hereby adopts as stipulations.

256 F.3d 1323, 1331 (Fed. Cir. 2001). In the absence of an express intent to impart a different or unique meaning to claim terms, the terms are presumed to have their ordinary meaning. *Id.* Claim limitations, however, must be read in view of the specification and prosecution history. *Id.* Indeed, the specification is often “the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1315.

### ANALYSIS

For ease of reference, the Court’s analysis of the forty-four disputed claim limitations proceeds in roughly the same order and format as presented by the parties in their Corrected Joint Claim Construction Pre-Hearing Statement. (Doc. No. 141.) Where possible, the Court discusses the construction of similar terms together.

#### 1. Sampling and Similar Terms

In the claims identified in the table below, the patents-in-suit use the terms “sampling,” “under-samples,” “sub-sampling,” and “sub-sample.” The parties dispute the meaning of these terms as follows:

<u>Term</u>	<u>Claims</u>	<u>ParkerVision</u>	<u>Qualcomm</u>
“Sampling”	1, 2, 3, 12, 17, 24, 27, and 82 of the ’518 Patent	“capturing energy of a signal at discrete times”	“reducing a continuous signal to a discrete signal”
“Under-samples”	5 and 13 of the ’734 Patent <sup>2</sup>	“sampling at an aliasing rate”	“sampling at an aliasing rate using negligible apertures”

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<sup>2</sup> The term “under-sample” is also used in claims 97 and 98 of the ’518 Patent.

<b>Term</b>	<b>Claims</b>	<b>ParkerVision</b>	<b>Qualcomm</b>
“Sub-sampling”	77, 81, 90, and 91 of the '518 Patent <sup>3</sup>		“sampling/sample at a sub-harmonic rate”
“Sub-sample”	1, 2, 22, 23, 25, and 31 of the '371 Patent		

The Court first considers the parties’ arguments as they relate to “sampling.” The Court then considers the arguments that relate to the remaining terms.

#### **A. “Sampling”**

ParkerVision contends that the term “sampling” used in the claims of the '518 Patent refers to the capturing of energy at discrete times, which is how one skilled in the art would understand the term in the context of these patents. (Doc. No. 122, pp. 9–10.) Qualcomm argues that one skilled in the art would understand the term sampling to refer to the process by which a continuous signal is reduced to a discrete signal. (Doc. No. 119, pp. 3–4.) Qualcomm also argues that ParkerVision’s definition improperly inserts the concept of “capturing energy” into this term. (*Id.* at 4.) ParkerVision asserts that Qualcomm’s definition does not place the term in the proper context and merely adopts “basic” terminology. (Doc. No. 122, p. 10.)

The patents-in-suit do not expressly define the term sampling, nor is the term defined or expanded upon in the file wrappers. The specification of the '518 Patent introduces the concept of sampling as follows:

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<sup>3</sup> See Doc. No. 141, p. 2. The Court notes that “sub-sampling” or a similar term is also found in claims 32, 77, 78, 90, and 93 of the '518 Patent.

Conventional signal processing techniques follow the Nyquist sampling theorem, which states that, in order to faithfully reproduce a sampled signal, the signal must be sampled at a rate that is greater than twice the frequency of the signal being sampled. When a signal is sampled at less than or equal to twice the frequency of the signal, the signal is said to be under-sampled, or aliased. Conventional signal processing thus teaches away from under-sampling and aliasing, in order to faithfully reproduce a sampled signal.

'518 Patent col. 18 ll. 15–24; see also '551 Patent col. 19 ll. 45–53.

Similarly, Professor Alan Oppenheim<sup>4</sup> introduces the concept of sampling, which is significant enough to merit a chapter in his textbook, as follows:

Under certain conditions, a continuous-time signal can be completely represented by and recoverable from knowledge of its values, or *samples*, at points equally spaced in time. This somewhat surprising property follows from a basic result that is referred to as the *sampling theorem*. This theorem is extremely important and useful. It is exploited, for example, in moving pictures, which consist of a sequence of individual frames, each of which represents an instantaneous view (i.e., a sample in time) of a continuously changing scene.

Alan V. Oppenheim, et al., *Signals & Systems* 514 (2d ed. 1996). Sampling is useful, teaches Professor Oppenheim, because “processing discrete-time signals is more flexible and is often preferable to processing continuous-time signals.” *Id.* Sampling is therefore

an extremely attractive and widely employed method for using discrete-time system technology to implement continuous-time systems and process continuous-time signals: We exploit sampling to convert a continuous-time signal to a discrete-time signal, process the discrete-time signal using a discrete-time system, and then convert back to continuous time.

*Id.* at 514–15.

In sum, while the specifications of the patents-in-suit do not explicitly define the term “sampling,” they introduce the term by referring to what was well-known in the art

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<sup>4</sup> Qualcomm cites to this text in support of its contentions.

and use the term in a manner consistent with how it is used in the art. Moreover, the patents-in-suit continue to use the term in its commonly understood sense, even when other well-known terms of art are expressly redefined or modified in the description. For example, the term “aliasing,” which has a commonly understood meaning to those skilled in the art and is used in that way in some places in the disclosure, *see id.*, is expressly re-imagined by the inventors to broadly refer to the energy transfer techniques disclosed in the patents, as well as the more conventional signal processing technique of under-sampling, ’518 Patent col. 20 ll. 55–59; *see also* ’551 Patent col. 20 ll. 7–11 (defining the term aliasing as referring both to “down-converting an EM signal by under-sampling the EM signal at an aliasing rate and to down-converting an EM signal by transferring energy from the EM signal at the aliasing rate”).

Given this contrast, the term’s well-known meaning to those skilled in the art, and the lack of an explicit definition in the specifications, the Court concludes that the term “sampling” as used in the claims of the ’518 Patent refers to “reducing a continuous-time signal to a discrete-time signal.”

#### **B. “Sub-Sampling”; “Sub-Sample”; and “Under-Samples”**

These terms appear in the claims of the ’518 Patent, the ’371 Patent, and the ’734 Patent. The ’518 Patent matured from a continuation of the application that was issued as the ’551 Patent. Thus, the ’518 Patent has the same specification as the ’551 Patent. The ’371 Patent and the ’734 Patent, however, do not claim priority to the ’551 Patent but instead “incorporate by reference,” among other things, the teachings of the ’551 Patent. *See, e.g.*, ’371 Patent col. 1 ll. 10–27.

ParkerVision contends that one skilled in the art would understand these terms to “refer to sampling at an aliasing rate, i.e., at a rate that is less than or equal to twice the



frequency of the signal being sampled.” (Doc. No. 122, p. 11.) Qualcomm, on the other hand, contends that “under-sampling” should be understood to mean “sampling at an aliasing rate using negligible apertures,” and that the terms “sub-sample” and “sub-sampling” mean sampling “at a sub-harmonic rate.” (Doc. No. 119, pp. 4–6.) These meanings, according to ParkerVision, improperly limit the scope of the claims. (Doc. No. 136, pp. 5–7.)

The terms “sub-sample” and “sub-sampling” generally do not appear in the patents-in-suit except in the claims.<sup>5</sup> To the extent they are discussed, they are introduced in the specifications during a discussion about the usefulness of the Nyquist sampling theorem. See ’518 Patent col. 18 ll. 15–24; ’551 Patent col. 19 ll. 45–53. The specifications note that “[w]hen a signal is sampled at less than or equal to twice the frequency of the signal, the signal is said to be under-sampled, or aliased.” ’518 Patent col. 18 ll. 15–24. Thus, according to the specification, “under-sampling” refers to a signal that was sampled at less than or equal to twice the frequency of the signal. Because the parties agree that the term “aliasing rate” means sampling at a rate “that is less than or equal to twice the frequency of the carrier signal,” (Doc. 141, p. 11), the meaning of “under-sampling” therefore could be simplified to “sampling at an aliasing rate.”

Qualcomm contends that “under-sampling” must also refer to an aliasing rate using negligible apertures. Figure 45 of the ’518 Patent, for example, is a Venn diagram that suggests that “under-sampling” is a distinct concept from “transferring energy.” Qualcomm’s arguments spring from this inference, as well as an inference drawn from

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<sup>5</sup> “Sub-sampling” also appears in the title of a master thesis publication listed on page 10 of the ’518 Patent.

the general structure of the specification, which discusses under-sampling separately from transferring energy. According to Qualcomm, the time duration of the apertures used to sample the input signal is one of the critical distinctions between under-sampling and transferring energy. (Doc. No. 119, p. 5.) Qualcomm therefore points to a passage from the '551 Patent stating that “under-sampling systems utilize a sample and hold system controlled by an under-sampling signal” that “include[] a train of pulses having negligible apertures that tends toward zero time in duration,” as support for its contention that under-sampling must also refer to an aliasing rate using negligible apertures. (*Id.*)

The patents-in-suit, however, do not use the term “under-sample” as narrowly as Qualcomm contends. While the specifications sometimes use the term “under-sampling” to distinguish certain systems from those systems that implement the disclosed transferred energy methods, the specifications use the term more broadly in other places.<sup>6</sup> The '734 Patent, for example, uses the term “under-sample” to refer to systems that transfer energy. See '734 Patent col. 12 ll. 46–52. Indeed, that patent refers to the “charge transferred during a pulse” as “an under-sample.” *Id.* Further, the '845 Patent teaches, in connection with a “non-negligible aperture,” that the “general concept is to under-sample the carrier while over sampling the information.” '845 Patent col. 189 ll. 23–26. The claims of the '518 Patent containing the term “under-sampling” similarly use that term in its broader sense. Claim 97 of the '518 Patent, for example,

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<sup>6</sup> A patent may, in some circumstances, use a term having multiple meanings. See *Ying-Nature (Guangdong) Wood Indus. Co., Ltd. v. Int'l Trade Comm'n*, 535 F.3d 1322, 1338 (Fed. Cir. 2008) (concluding that a claim term may have two different meanings).

encompasses a method having the step of “under-sampling the first signal over aperture periods to transfer energy from the first signal.” ’518 Patent col. 120 ll. 55–57.

In view of the use of “sampling” in the specification of the ’734 Patent, and the use of the term “under-sampling” in the claims of the ’518 Patent, the Court concludes that ParkerVision’s proposed construction—“capturing energy of a signal at discrete times”—is the better one.

As for the terms “sub-sample” and “sub-sampling,” the Court concludes that it would be improper to conflate the addition of the prefix “sub” to sampling in the claims of the ’518 Patent and the ’371 Patent with the discussion in the specifications concerning sub-harmonic frequencies. The Court concludes that the claims of the ’518 Patent use the terms as synonyms for the term “under-sample.” See, e.g., *Tandon Corp. v. U.S. Int’l Trade Comm’n*, 831 F.2d 1017, 1023–24 (Fed. Cir. 1987). For example, claim 32 recites a “method of claim 29, wherein in step (2) the first signal is sub-sampled.” ’518 Patent col. 116 ll. 35–36. Step (2) of claim 29 is directed to “sampling the first signal over aperture periods to transfer energy from the first signal.” *Id.* at col. 116 ll. 25–26. Additionally, claim 94 of the ’518 Patent embraces an “apparatus of claim 93, wherein N indicates: a harmonic or sub-harmonic of the aliasing rate.” ’518 Patent col. 120 ll. 53–54. Claim 93 claims an apparatus having a “means for generating an energy transfer signal that is used to control said sub-sampling, the energy transfer signal having an aliasing rate determined according to: (a frequency of the first signal +/- a frequency of the second signal) divided by N.” *Id.* at col. 120 ll. 41–46. Qualcomm’s proposed construction conflicts with how “sub-sampling” is used in these and other claims. As such, the Court declines to adopt Qualcomm’s construction for the terms “sub-sample” and “sub-sampling.”

In view of the above, the Court construes “under-sampling,” “sub-sampling,” and “sub-samples” to mean “sampling at an aliasing rate.”

## 2. “Transferring . . . Energy” and Similar Terms

In the claims identified in the table below, the patents-in-suit use several limitations directed at “transferring . . . energy,” which the Court will refer to as “transferring energy” or “energy transfer” terms. The parties dispute the meaning of these terms as follows:

<u>Term</u>	<u>Claims</u>	<u>ParkerVision</u>	<u>Qualcomm</u>
“transferring non-negligible amounts of energy from the carrier signal”	1, 2, 3, 8, 9, 12, 16, 20, 39, 41, 50, 54, 55, 57, 92, 93, 108, 113, <sup>7</sup> and 126 of the '551 Patent	“transferring energy (i.e., voltage and current over time) in amounts that are distinguishable from noise”	“moving sufficient energy from the carrier signal into storage to cause substantial distortion of the carrier signal”
“sampling the carrier signal . . . to transfer energy”	1, 2, 3, 12, 17, 24, and 27 of the '518 Patent		
“transferring a . . . portion of the energy . . . of the carrier signal”	41 and 50 of the '551 Patent; and 5 and 6 of the '845 Patent		

<sup>7</sup> In claim 113 of the '551 Patent, this term is recited as “the step of transferring controlled substantial amounts of energy from the carrier signal during aperture periods.”

<b>Term</b>	<b>Claims</b>	<b>ParkerVision</b>	<b>Qualcomm</b>
“receives non-negligible amounts of energy transferred from a carrier signal”	23, 24, 25, 26, 31, 32, 135, 149, 150, 161, 192, 193, 195, 196, 198, 202, and 203 of the '551 Patent	“receives energy (i.e., voltage and current over time) from the carrier signal in amounts that are distinguishable from noise”	“stores sufficient energy transferred from the carrier signal to cause substantial distortion of the carrier signal”
“sub-sampling the first signal . . . to transfer energy”	77, 81, 90, and 91 of the '518 Patent	“transferring energy (i.e., voltage and current over time) in amounts that are distinguishable from noise”	“moving sufficient energy from the carrier signal into storage to cause substantial distortion of the carrier signal”

ParkerVision argues that the dispute between the parties turns on what is meant by “non-negligible amounts of energy.” (Doc. No. 122, pp. 4–5.) ParkerVision contends that one skilled in the art would, after reading the all of the disclosures in the patents-in-suit, recognize that these terms refer to techniques that involve transferring non-negligible energy in amounts distinguishable from noise. (*Id.*) Qualcomm, on the other hand, contends that these terms should be understood in the context of the “alleged novelty of the claimed method of down-conversion by ‘transferring . . . energy.’” (Doc. No. 119, pp. 6–9.) Qualcomm argues that a person of ordinary skill in the art would understand this term to mean moving energy from the carrier signal into storage sufficient to cause substantial distortion of the carrier signal. (*Id.*) In support, it points to statements made by ParkerVision during the prosecution of a related U.S. patent application and a European patent application. (*Id.*)

The specifications teach that methods and systems for down conversion work by:

transferring non-negligible amounts of energy from the EM signals. The resultant down-converted signals have sufficient energy to allow the down-converted signals to be distinguishable from noise. The resultant down-converted signals also have sufficient energy to drive lower impedance circuits without buffering.

'551 Patent col. 63 ll. 29–34. Continuing, the specifications teach:

Unlike under-sampling signals that have negligible aperture pulses, the energy transfer signal includes a train of pulses having non-negligible apertures that tend away from zero. This provides more time to transfer energy from an EM input signal. One direct benefit is that the input impedance of the system is reduced so that practical impedance matching circuits can be implemented to further improve energy transfer and thus overall efficiency. The non-negligible transferred energy significantly improves the signal to noise ratio and sensitivity to very small signals, as well as permitting the down-converted signal to drive lower impedance loads unassisted. Signals that especially benefit include low power ones typified by RF signals. One benefit of a non-negligible aperture is that phase noise within the energy transfer signal does not have as drastic of an effect on the down-converted output signal as under-sampling signal phase noise or conventional sampling signal phase noise does on their respective outputs.

*Id.* at col. 66 ll. 36–54.

Rather than address these and other portions of the specifications, Qualcomm relies on statements made during the prosecution of a subsequent patent, the prosecution of a foreign counterpart application, and a press release. The Court does not find these statements persuasive. The comments in the U.S. application appear to have been made not to define transferring energy but rather to distinguish the storage devices that were the subject of that subsequent application from the devices used when a signal is under-sampled.

As for the statements made during the prosecution of the European application, the Federal Circuit has cautioned “against indiscriminate reliance on the prosecution of corresponding foreign applications in the claim construction analysis.” *AIA Eng’g Ltd. v. Magotteaux Int’l S/A*, 657 F.3d 1264, 1279 (Fed. Cir. 2012). Such caution is warranted

here because the language that Qualcomm points to in the foreign prosecution was offered in support of the addition of the following limitation: “wherein said transferring of energy substantially prevents accurate voltage reproduction of the modulated carrier signal during the time apertures.” (Doc. No. 120-7.) This limitation is not the same as those at issue in this case. Further, the Court has not been presented with the context in which these statements were made, that is, the claims that the limitation modified, the requirements of foreign laws to which the applications are responding, and the examination practices of the foreign office. *See, e.g., AIA Eng’g Ltd.*, 657 F.3d at 1279. As such, the import and relevance of these statements are murky at best.

While the Court finds ParkerVision’s definition more persuasive, the Court sees no reason to explicitly define “energy” as ParkerVision does in its proposed claim construction. One skilled in the art clearly would know what is meant by energy. The parenthetical is unnecessary and will be omitted from the Court’s construction of these terms.

Accordingly, the Court will construe “transferring non-negligible amounts of energy from the carrier signal,” “sampling the carrier signal . . . to transfer energy,” and “transferring a . . . portion of the energy . . . of the carrier signal” to mean “transferring energy in amounts that are distinguishable from noise.” The remaining terms, “receives non-negligible amounts of energy transferred from a carrier signal” and “sub-sampling the first signal . . . to transfer energy,” to mean “receives energy from the carrier signal in amounts that are distinguishable from noise” and “transferring energy in amounts that are distinguishable from noise,” respectively.

### 3. “Lower Frequency Signal”

“Lower frequency signal” appears in claims 1, 2, 3, 8, 9, 12, 16, 20, 23, 24, 25, 26, 31, 32, 39, 41, 50, 54, 55, 57, 92, 93, 108, 113, 126, 135, 149, 150, 161, 192, 193, 195, 196, 198, 202, and 203 of the ’551 Patent and claims 1, 2, 22, 23, 25, and 31 of the ’371 Patent. The parties offer the following constructions of this limitation:

<b><u>ParkerVision</u></b>	<b><u>Qualcomm</u></b>
“a signal with frequency below the carrier signal frequency”	“a signal with frequency below the carrier signal frequency and above the baseband frequency”

The dispute between the parties turns on whether this claim limitation embraces the baseband frequency. ParkerVision argues that the plain language used encompasses all frequencies lower than that of the carrier signal. (Doc. No. 122, pp. 7–8.) It contends further that there has been no lexicography or disclaimer which would limit the scope of this claim term in a way that would exclude the baseband frequency. (*Id.* at 7.)

Qualcomm asserts that this term was explicitly defined in the specification to exclude the baseband frequency. (Doc. No. 137, pp. 6–7.) Qualcomm reaches this conclusion because the specification of the ’551 Patent states that “the terms lower frequency, intermediate frequency, intermediate and IF are used interchangeably herein,” ’551 Patent col. 14 ll. 46–47, and “[w]hen a modulated carrier signal is down-converted to a lower frequency signal, the lower frequency signal is referred to herein as an intermediate frequency (IF) signal  $F_{IP}$ ,” *id.* at col. 19 ll. 15–18. According to Qualcomm, “the specification identifies direct conversion to baseband as a special case, distinct from down-conversion utilizing an intermediate frequency.” (Doc. No. 137, p. 7.)



On their face, the words chosen by the patentee do not evince the intent to exclude the baseband frequency. Thus, ParkerVision's definition—"a signal with frequency below the carrier signal frequency"—more closely aligns with the plain language of the claim. The statements from the specification to which Qualcomm points do not show an intention to exclude the baseband frequency. The first statement is taken from the portion of the specification that defines the term "intermediate frequency." The specification states:

The term intermediate frequency (IF) signal, when used herein, refers to an EM signal that is substantially similar to another EM signal except that the IF signal has a lower frequency than the other signal. An IF signal frequency can be any frequency above zero HZ. Unless otherwise stated, the terms lower frequency, intermediate frequency, intermediate and IF are used interchangeably herein.

'511 Patent col. 14 ll. 42–48. The final sentence in this passage does not imply that the terms "lower frequency," "intermediate frequency," "intermediate," and "IF" are identical. Rather, that sentence informs the reader that the identified terms may be used interchangeably, which is to say that the description of the invention is drafted so as to allow one of these terms to be exchanged with another without loss of function.

The second statement is taken from the portion of the specification of the '551 Patent in which the patentees discuss the demodulation of the carrier signal. *Id.* at col. 19 ll. 6–43. The specification introduces this concept by referencing a common problem in the technical field—that is, "it is generally impractical to demodulate the baseband signal  $F_{MB}$  directly from the modulated carrier signal  $F_{MC}$ "—and a well-known solution to that problem—that is, the down-conversion of the carrier signal to a frequency lower than the carrier signal but higher than the baseband signal. *Id.* at col. 19 ll. 10–14. The statement cited by Qualcomm is an extension of this discussion

that identifies the latter as an “intermediate frequency.” When taken in context, one skilled in the art would recognize that the lower frequency signal in this discussion can be either (1) the baseband signal or (2) an intermediate frequency.

Accordingly, the Court construes the term “lower frequency signal” to mean “a signal with frequency below the carrier signal frequency.”

#### 4. “Harmonic or Sub-Harmonic of the Carrier Signal” and Similar Terms

In the claims identified in the table below, the patents-at-issue use the terms “n represents a harmonic or sub-harmonic of the carrier signal” and “n indicates a harmonic or sub-harmonic of the carrier signal.” The parties’ proposed meanings of these terms are as follows:

<u>Term</u>	<u>Claims</u>	<u>ParkerVision</u>	<u>Qualcomm</u>
“where n represents a harmonic or sub-harmonic of the carrier signal”	1, 2, 3, 8, 9, 12, 16, 20, 23, 24, 25, 26, 31, 32, 39, 41, 50, 54, 55, 57, 92, 93, 108, 113, 126, 135, 149, 150, 161, 192, 193, 195, 196, 198, 202, and 203 of the '551 Patent	“n is 0.5 or an integer greater than or equal to 1”	“n is 0.5 or an integer greater than 1”
“wherein N indicates a harmonic or sub-harmonic of the carrier signal.”	1, 2, 3, 12, 17, 24, 27, and 82 of the '518 Patent		

The parties dispute whether the terms “harmonic or sub-harmonic of the carrier signal” embrace the situation where “n” is equal to 1. Qualcomm argues that when n

equals 1, the specifications teach that the corresponding aliasing rate is the “fundamental frequency,” which it contends is different than a harmonic or sub-harmonic. (Doc. No. 119, p. 13.)

The Court declines to adopt Qualcomm’s construction. The specifications teach that  $n$  can be equal to 1, see, e.g., ’551 Patent col. 30 ll. 23, and that “ $n$  identifies a harmonic or sub-harmonic of the aliasing rate (generally,  $n=0.5, 1, 2, 3, 4, \dots$ ),” *id.* at col. 23 ll. 48–59. The Court therefore construes these terms to mean “ $n$  is 0.5 or an integer greater than or equal to 1.”

### 5. “Integrating . . . Energy” and Similar Terms

In the claims identified in the table below, the patents-in-suit contain limitations relating to “integrating . . . energy.” The parties dispute the meaning of these terms as follows:

<u>Term</u>	<u>Claims</u>	<u>ParkerVision</u>	<u>Qualcomm</u>
“integrating the . . . energy”	50, 108, and 113 of the ’551 Patent; and 1, 2, 3, 12, 17, 24, 27, 77, 81, 82, 90 and 91 of the ’518 Patent	“accumulating the energy”	term is indefinite, or “storing in a storage module the energy transferred during an aperture period”
“energy is . . . integrated”	1, 2, 22, 23, 25, and 31 of the ’371 Patent	“energy is accumulated”	term is indefinite, or “the energy transferred during an aperture period is stored in a storage module”

<b>Term</b>	<b>Claims</b>	<b>ParkerVision</b>	<b>Qualcomm</b>
“integrates the . . . energy”	161, 198, and 202 of the '551 Patent	“accumulates the energy”	term is indefinite, or “stores in a storage module the energy transferred during an aperture period”
“integrates . . . energy”	203 of the '551 Patent	“accumulates energy”	term is indefinite, or “stores in a storage module the energy transferred during an aperture period”
“the integrated energy”	198, 202, and 203 of the '551 Patent	“the accumulated energy”	term is indefinite, or “the transferred energy stored in a storage module during an aperture period”

Qualcomm contends that these claim limitations are indefinite. (Doc. No. 119, pp. 14–15.) It argues that a person skilled in the art would not understand what is meant by these terms because “integrating . . . energy” has no well-known physical meaning and none has been explicitly supplied in the specifications. ParkerVision responds that the term “integration” is easily understood by a person skilled in the art, as is the term “energy.” (Doc. 136, p. 11.) As such, ParkerVision argues, these claim terms are not insolubly ambiguous and without discernible meaning. (*Id.*)

A patent specification must “conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.” 35 U.S.C. § 112, ¶ 2. This requirement is satisfied where “one skilled in the art would understand the bounds of the claim when read in light of the specification

...” *Exxon Research & Eng’g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001). A claim is not indefinite merely because it is difficult to construe. *Id.* To be indefinite, a claim term must be “not amenable to construction or insolubly ambiguous.” *Ultimax Cement Mfg. Corp. v. CTS Cement Mfg. Corp.*, 587 F.3d 1339, 1352 (Fed. Cir. 2009).

The Court concludes that the “integrating . . . energy” terms are not so unknowable as to render the claims indefinite. “Integrate” is a transitive verb meaning “to form, coordinate, or blend into a functioning or unified whole,” “to unite with something else,” or “to incorporate into a larger unit.” *Merriam-Webster’s Collegiate Dictionary* 650 (11th ed. 2007). While “integrate” may also have a precise mathematical meaning, the claims and specifications can be understood to use “integrating” in the more common sense, that is, to add together.

For instance, claim 53 of the ’551 Patent encompasses the “method according to claim 52, wherein step (3) comprises the step of integrating the transferred energy and generating the lower frequency signal from the integrated energy.” Claim 52 recites a method comprising the step of “transferring a substantial portion of energy contained in N periods of the carrier signal . . . .” When read together, these claims show that “integrated energy” is collected over discrete time periods and added together.<sup>8</sup> Because the specifications teach a method of transferring energy from one signal to another, one skilled in the art, after reading the claims and specification, would come to

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<sup>8</sup> In addition, at least one of the references cited in the ’551 Patent uses the term “integration” in this way, which suggests that at least some persons skilled in the art use the term to mean accumulation of an item of interest over time. See ’551 Patent p. 5 (citing Augusto Burgueño et al., *Influence of Rain Gauge Integration Time on the Rain Rate Statistics Used in Microwave Communications*, 43 *Annales des Telecommunications* 522–27 (Sep./Oct. 1988)).

appreciate the “integrating energy” terms to refer to the process of adding together or summing the energy transferred during one or more aperture periods.

Thus, of the two proffered constructions, ParkerVision’s is the more persuasive. Accumulate is a close approximation to the plain meaning of integrate, and it is descriptive of one of the functions of capacitors, which the Court understands are used in one embodiment of the invention. ParkerVision’s construction is also preferable because it encompasses uses like that in claim 52, which clearly contemplates the accumulation of energy from more than one aperture period, whereas Qualcomm’s definition does not.

Accordingly, the Court adopts ParkerVision’s claim construction for these terms.

#### **6. “Finite Time Integrating Module” and “Finite Time Integrating Operation”**

The parties dispute the meaning of the terms “finite time integrating module” and “finite time integrating operation.” These terms appear in the claims identified below from the ’845 Patent. The parties dispute the meaning of these terms as follows:

<u>Term</u>	<u>Claims</u>	<u>ParkerVision</u>	<u>Qualcomm</u>
“finite time integrating module”	1, 3, 4, 5, 6, 7, 8, 9, 12, 13, 17, 18, 19, 20, 22, 23, and 24	“circuitry that can perform a finite time integrating operation”	“a module with a switch, a pulse generator, and a storage module that stores the energy transferred during an aperture period”
“finite time integrating operation”	1, 3, 4, 5, 6, 7, 8, 9, and 12	“convolving a portion of the carrier signal with an approximate representation of itself”	“an operation that distorts the carrier signal and stores the energy transferred during an aperture period”

### A. “Finite Time Integrating Operation”

ParkerVision contends that the inventors of the patents-in-suit coined the term “finite time integrating operation” as an alternative solution to matched filtering/correlating processors. (Doc. No. 122, pp. 13–14.) According to ParkerVision, the specification of the ’845 Patent teaches that a finite time integrating operation works by convolving a portion of the carrier signal with an approximate representation of itself. (*Id.*) While the specification teaches one skilled in the art to use an approximate half cycle of the carrier signal, ParkerVision contends instead that the invention is not limited to that embodiment. (*Id.*) It argues that the correct construction of “finite time integrating operation” refers to “convolving a portion of a signal” rather than to “an approximate half cycle of the carrier signal.” (*Id.*)

Qualcomm, on the other hand, argues that the term “finite time integrating operation” involves the transfer of energy from a carrier signal into storage. (Doc. No. 119, pp. 16–17.) Thus, according to Qualcomm, such an operation results in the distortion of the carrier signal during each aperture period. (*Id.*) Qualcomm argues that ParkerVision’s proposed construction is incorrect because it fails to account for the distinctions between the three categories of operations taught by the ’845 Patent. (Doc. No. 137, pp. 12–13.) Qualcomm argues that a person skilled in the art would understand that a “matched filter/correlating operation” is distinct from a “finite time integrating operation,” based on an election/restriction requirement interposed by the patent examiner during the prosecution of the ’845 Patent. Qualcomm contends that, as construed by ParkerVision, the “matched filter/correlating operation” taught by the ’845 Patent would be identical to the “finite time integrating operation.” (*Id.*)

The parties' differences encompass roughly two issues. First, the arguments relate to the signal that is convolved with the carrier signal during the down-conversion process, which is referred to in the specification as an "impulse response." Second, the parties dispute whether a finite time integrating operation is limited to a single aperture period.

### 1. Impulse Response

The '845 Patent teaches those skilled in the art that the disclosed invention can be implemented using, among other things, a "matched filtering/correlating operation" and a "finite time integrating operation." '845 Patent col. 128 ll. 44–48. Both of these embodiments operate by accumulating the energy of a carrier signal and using the accumulated energy to form a down-converted signal.<sup>9</sup> *Id.* at col. 128 ll. 26–51. According to the specification, both operations "recursively determine a voltage or current value for approximate half cycles (e.g.,  $\frac{1}{2}$ ,  $1\frac{1}{2}$ ,  $2\frac{1}{2}$ , etc.) of a carrier signal, typically at a sub-harmonic rate, and use the determined voltage or current values to form a down-converted version of an electromagnetic signal." *Id.* at col. 128 ll. 62–66.

The "matched filtering/correlating" operation and "finite time integrating operation" differ in that the first operation involves "convolving an approximate half cycle of the carrier signal with a representation of itself," *id.* at col. 129 ll. 30–34; in other words, it involves convolving an input signal (the modulated carrier signal) with an impulse response "identical to the modulated carrier signal,  $S_c(t)$ , to be processed," *id.* at col. 129 ll. 58–61; see also *id.* at col. 129 ll. 34–36.

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<sup>9</sup> As such, the Court rejects Qualcomm's proposed construction of this term for the reasons expressed in the section construing the "transferring energy" terms.



A “finite time integrating operation,” on the other hand, involves convolving the carrier signal with a “half sine impulse response,” a “rectangular impulse response,” or a “step function having a duration that is substantially equal to the time interval defined for the waveform, typically a half cycle of the electromagnetic signal.” See *id.* at col. 137 ll. 60–65; see *also id.* at col. 130 ll. 35–40; *id.* at col. 131 ll. 28–30. Similarly, the ’845 Patent’s claims are directed to finite time integrating operations in which the impulse responses are “approximately rectangular,” *id.* at col. 192 ll. 12–16 (claim 2), and step functions, *id.* at col. 192 ll. 21–27 (claim 4). According to the specification of the ’845 Patent, such impulse responses become, in practice, “triangular or nearly sinusoidal for very high frequency implementations. *Id.* at col. 138 ll. 19–26. These impulse responses are not representations of the original signal, nor are they approximations of the original signal. Rather, they are simply-generated functions that are useful because when they are used as described in the specification, the resulting output approximates the output of a matched filtering/correlating operation. *Id.* at col. 131 ll. 47–48.

The ’845 Patent therefore teaches that a finite time integrating operation involves convolving the carrier signal with a half sine impulse response, a rectangular impulse response, a step function, a triangular response, or a nearly sinusoidal response. While the Court is most reluctant to substitute its judgment for that of the parties and counsel, who are intimately familiar with the patents-in-suit, it nonetheless appears that neither proposed construction comports with the description of “finite time integrating operation” that was provided by the ’845 Patent’s specification. This is problematic because “finite time integrating operation” has no precise and generally understood meaning in the art. As such, the Court must look to the specification for guidance as to the meaning of the term. *On-Line Tech. v. Bodenseewerk Perkin-Elmer*, 386 F.3d 1133, 1138 (Fed. Cir.

2004) (noting that courts should turn to the intrinsic evidence, such as the specification, for guidance as to the meaning of terms having no generally understood meaning in the art). The Court therefore rejects the parties' proposed constructions.<sup>10</sup>

## 2. Single Aperture Period

Qualcomm's proposed construction limits a "finite time integrating operation" to energy that is transferred during a single aperture period. The specification does not explicitly teach such a limitation, and Qualcomm provides no reason for importing a "single aperture" requirement into the definition of "finite time integrating operation" other than its conclusion that the operation must necessarily be completed during a single aperture period.

The Court is not persuaded that such an conclusion is warranted. First, the Court is not inclined to include a single aperture requirement in view of the Federal Circuit's instruction not to import limitations from the specification into the claims. *Phillips*, 415 F.3d at 1323. Second, the '845 Patent explicitly teaches that some embodiments of the disclosed inventions can accumulate energy over multiple aperture periods. See, e.g., '845 Patent col. 151 ll. 30–45. As such, Qualcomm's proposed construction is not consistent with the specification. *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1372 (Fed. Cir. 2003) (rejecting a proposed claim construction where the specification discloses embodiments not consistent with the proposal). Third, because the finite time integrating operation in step (1) of claim 1 of the '845 Patent is

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<sup>10</sup> The Court is not inclined to define this term by reference to individual components, as Qualcomm urges, because Qualcomm has not shown that those components can be used to generate all of the different impulse responses that are taught in the specification of the '845 Patent.

explicitly performed “on a portion of a carrier signal,” it would be confusing to include a reference to aperture periods in the definition of “finite time integrating operation.”

### **B. “Finite Time Integrating Module”**

ParkerVision contends that “finite time integrating module” should be construed to mean “circuitry that can perform a finite time integrating operation.” (Doc. No. 122, pp. 13–14.) ParkerVision points out that this term was added to overcome a Section 101 rejection to the original claims, which referred only to a “finite time integrating operation.” (*Id.*) Qualcomm contends that ParkerVision’s claim construction is incorrect because it is purely functional. (Doc. No. 137, pp. 12–13.) Qualcomm’s proposed construction consists of a list of certain electrical components. (*Id.*)

The specification discloses examples of embodiments of the disclosed invention. See, e.g., ’845 Patent col. 131 ll. 26–32 (describing “an example finite time integrating system 15100, which can be used to implement method 15000. . . . As can be seen in FIG. 151, system 15100 comprises a switching module 15102 and an integrating module 15104”). The specification also teaches that embodiments of a “finite time integrating processor” can be implemented using a complementary metal oxide semiconductor. *Id.* at col. 137 ll. 53–56; col. 138 ll. 1–29.

The Court agrees with ParkerVision that Qualcomm’s proposed construction is too limiting. The Federal Circuit has made it quite clear that, while claim terms are understood in light of the specification, a claim construction must not import limitations from the specification into the claims. See *Phillips*, 415 F.3d at 1323. Moreover, as noted above, Qualcomm has not demonstrated that the components it identified can be used to generate all of the different impulse responses that are taught in the

specification of the '845 Patent. The Court therefore will not limit the definition of this term to the single embodiment identified by Qualcomm.

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Accordingly, the Court construes these terms as follows. The term “finite time integrating operation” refers to “convolving a portion of the carrier signal with an impulse response that is a rectangular, triangular, half sine, nearly sinusoidal, or a step function.” A “finite time integrating module” is “circuitry that can perform a finite time integrating operation.”

#### 7. “Accumulating the Result”

The term “Accumulating the Result” appears in claims 1, 3, 4, 5, 6, 7, 8, 9, and 12 of the '845 Patent. The parties propose the following meanings for this term:

<u>ParkerVision</u>	<u>Qualcomm</u>
no construction necessary	“storing in a storage module the energy transferred over multiple aperture periods”

Claim 1 of the '845 Patent embraces:

A method for down-converting an electromagnetic signal, comprising the steps of

- (1) performing with a finite time integrating module a finite time integrating operation on a portion of the carrier signal;
- (2) accumulating the result of the finite time integrating operation of step (1); and
- (3) repeating steps (1) and (2) for additional portions of the carrier signal.

The Court agrees with ParkerVision that no construction of “accumulating the result” is necessary. Nothing in the plain language of the claim suggests that the energy accumulated in the second step of the method must be “transferred over multiple

aperture periods.” Accordingly, the Court declines to adopt Qualcomm’s claim construction.

### 8. “Impedance Matching” and Similar Terms

In the claims identified in the table below, the patents-in-suit contain limitations relating to “impedance matching.” The parties dispute the meaning of these terms as follows:

<u>Term</u>	<u>Claims</u>	<u>ParkerVision</u>	<u>Qualcomm</u>
“impedance matching”	77, 81, 90, and 91 of the ’518 Patent	“transferring desired power”	“maximizing power transfer throughout a signal path”
“output impedance match circuit”	25 of the ’551 Patent	“a circuit configured to transfer desired power from the energy sampling circuitry”	“a circuit configured to maximize power transfer throughout the output path”
“substantially impedance matched input path”	12 of the ’551 Patent; and 12 of the ’518 Patent	“circuitry configured to transfer desired power to the input path of the energy sampling circuitry”	“a circuit configured to maximize power transfer throughout the input path”
“input impedance match circuit”	24 of the ’551 Patent; and 23 of the ’371 Patent	“circuitry configured to transfer desired power to the input of the energy sampling circuitry”	
“first impedance match coupled to said . . . input terminal”	4 of the ’734 Patent	“first circuitry configured to transfer desired power to said input terminal”	

<u>Term</u>	<u>Claims</u>	<u>ParkerVision</u>	<u>Qualcomm</u>
"second impedance match coupled to said . . . input terminal"	4 of the '734 Patent	"second circuitry configured to transfer desired power to said input terminal"	

The nub of the dispute concerning these terms is whether power transfer must be "maximized." Qualcomm contends the term "impedance matching" refers to a variety of methods used to "avoid the deleterious effects of impedance mismatch, and thus maximize power transfer." (Doc. No. 119, p. 19.) In support, Qualcomm relies on a prior art reference cited by the examiner during the prosecution of the '551 Patent. (*Id.*)

ParkerVision, on the other hand, contends that Qualcomm's definition is too rigid and that a person skilled in the art would understand that the amount of power transferred would not need to be perfectly maximized throughout the input path. (Doc. No. 122, pp. 17–18.) In support, ParkerVision offers a definition from the 7th edition of *The Authoritative Dictionary of IEEE Standards Terms* which defines impedance matching in the same manner as the term "load matching." (Doc. No. 136, pp. 13–14.)

That dictionary defines "load matching" as:

(1) (induction and dielectric heating) The process of adjustment of the load-circuit impedance to produce the desired energy transfer from the power source to the load.

(2) The technique of either adjusting the load-circuit impedance or inserting a network between two parts of a system to produce the desired power transfer or signal transmission.

(Doc. No. 136-2.)

According to the specifications, impedance matching is used to "*optimize* power transferred through the receiver system." '551 Patent col. 25 ll. 25–26 (emphasis

added); see *also* '518 Patent col. 105 ll. 35–38 (teaching that an “impedance matching circuit can be utilized to efficiently couple the down-converted signal with an output impedance”). “Optimized” does not mean “maximized” but rather something more like “adjusted,” “equal,” or “appropriate.”

The specifications teach that an impedance matching circuit could be used to “efficiently couple” a source—say, “an input EM signal” with an impedance of fifty ohms—to the circuitry of the invention—say, an “energy transfer module” with a different impedance. '551 Patent col. 105 ll. 7–17. In other words, impedance matching is used to refer to the process of marrying up the impedance of different components of the system. While this may, under some circumstances, result in maximum power transfer, that is not the only outcome taught in the specification. Thus, Qualcomm’s understanding of this term is different than what is taught in the specifications.

Accordingly, the Court is not inclined to define these terms as requiring maximum power transfer. These terms shall be construed in the manner proposed by ParkerVision.

#### **9. “Differential Down-Converted Output Signal” and Similar Terms**

The parties dispute the meaning of three similar terms found in the '734 Patent relating to differential down-conversion. The terms, the claims in which they are found, and the parties’ proposed constructions are as follows:

<b>Term</b>	<b>Claims</b>	<b>ParkerVision</b>	<b>Qualcomm</b>
“differential down-converted output signal”	1, 4, 5, 6, 9, 12, 13, 14, and 15	no construction necessary, or “the output signal from the differential frequency down-conversion module”	“a signal that is the down-converted replica of the differential input signal”
“differential frequency down-conversion module”	1, 4, 5, 6, 9, 12, 13, 14, and 15	“circuitry for frequency down-converting a carrier signal by differentially combining positive and negative transferred energy samples”	“a circuit that down-converts a differential input signal and outputs a differential down-converted replica of the input signal”
“differentially down-converting”	12, 13, 14, and 15	“down-converting a carrier signal by differentially combining positive and negative transferred energy samples”	“down-converting a differential input signal and outputting a differential down-converted replica of the input signal”

ParkerVision contends that the '734 Patent teaches that its energy-transfer technology can be used in a differential architecture “by combining positive and negative energy samples” to reduce a problem known as “DC offset.” (Doc. No. 122, pp. 15–16.) Qualcomm, on the other hand, contends that the “differential . . . signals” terms would be understood by a person of ordinary skill in the art to “refer to a pair of signals, one of which is the inverted version of the other.” (Doc. No. 119, p. 19.) Qualcomm’s expert explains that the components of a differential signal are commonly designated as positive and negative, which is similar to the manner in which the



specification of the '734 Patent designates the components of the differential frequency down-conversion module. (*Id.* at 20.)

Claim 1 of the '734 Patent is directed to:

An apparatus for down-converting an electromagnetic signal, comprising:

a differential frequency down-conversion module that differentially receives an input signal, wherein said differential frequency down-conversion module comprises a positive input terminal and a negative input terminal, and wherein said differential frequency down-conversion module outputs a differential down-converted output signal;

wherein said differential frequency down-conversion module comprises:

- a first switch,
- a second switch, and
- a storage element coupled between said first and second switches

'734 Patent col. 84 ll. 47–54. The first wherein clause clearly and succinctly identifies the “differential down-converted output signal” as the output from the differential frequency down-conversion module, which is the construction proposed by ParkerVision.

Likewise, the specification of the '734 Patent is consistent with ParkerVision's proposed construction. That patent teaches:

In a preferred embodiment, differential UFD module 9508 comprises a first UFT module 9522, a second UFT module 9524, and a storage module 9534. In a preferred embodiment, storage module 9534 comprises a second capacitor 9526.

A positive or “plus” signal input of a differential RF input signal 9528 is input through first impedance match 9502 to a first terminal 9536 of tank circuit 9506. A negative or “minus” signal input of differential RF input signal 9528 is input through second impedance match 9504 to a second terminal 9538 of tank circuit 9506.

First UFT module 9522 is coupled to first terminal 9536 of tank circuit 9506, and receives the “plus” signal input of differential RF input signal 9528. Second UFT module 9524 is coupled to second terminal 9538 of tank circuit 9506, and receives the “minus” signal input of differential RF input signal 9528.

First and second UFT modules 9522 and 9524 down-convert differential RF input signal 9528 according to a control signal 9532, which is output by control signal generator 9510, in a manner as described elsewhere herein. The outputs of first and second UFT modules 9522 and 9524 are stored in storage module 9534, and output as differential output signal 9530.

First UFT module 9522 outputs a “plus” output of differential output signal 9530. Second UFT module 9524 outputs a “minus” output of differential output signal 9530. Differential output signal 9530 is equal to the difference voltage between these “plus” and “minus” outputs.

*Id.* at col. 59, ll. 30–58. Later, the specification notes that a “differential down-converted signal comprises a positive node down-converted signal and a negative node down-converted signal.” *Id.* at col. 60 ll. 28–33; see also Fig. 113. The specification then describes that, in a subsequent step, the “the differential down-converted signal is measured between the positive node down-converted signal and the negative node down-converted signal. The DC offset voltages in the positive node down-converted signal and the negative node down-converted signal substantially cancel, as described above.” *Id.* at col. 60, ll. 41–46.

The specification does not describe the down-converted output signal as a replica of the input signal. Rather, it describes the output signal as being derived from the plus and minus signals. This difference is notable. By describing the output signal in this way, the differential output signal can be described using commonly understood terminology while at the same time capturing the application of that technique to the energy-transfer technology that is the subject of the patents-in-suit.

Accordingly, the Court declines to adopt Qualcomm’s claim constructions. The Court finds that “differential down-converted output signal” does not need to be construed, while the remaining terms should be construed in the manner proposed by ParkerVision.

## 10. “Interpolation Filter”

The term “interpolation filter” appears in claim 9 of the ’845 Patent. The parties propose the following meanings:

<b>ParkerVision</b>	<b>Qualcomm</b>
“circuitry that outputs a smoothed signal between the input sampled values”	“a component that adds additional values between sampled values and then filters both the original samples and the added values”

ParkerVision contends that one skilled in the art would understand that an “interpolation filter smoothes a signal by interpolating the input values” (Doc. No. 122, p. 18.) It points to an embodiment disclosed in the specification of the ’845 Patent known as a “zero order data hold filter” (also referred to in the patents as “Z0DH”) as an example interpolation filter. (*Id.*) Qualcomm argues that the concept of interpolations would be known to one skilled in the art as “the fitting of a continuous signal to a set of sample values.” (Doc. No. 119, p. 22.) This is commonly used, according to Qualcomm, “for reconstructing a function, either approximately or exactly, from samples.” (*Id.*)

The ’845 Patent does not explicitly define the term “interpolation filter,” and neither party has offered any additional intrinsic evidence of its meaning. The specification teaches that the output of the down-conversion process is passed to a “reconstruction filter or an interpolation filter.” ’845 Patent col. 129 ll. 53–55; *id.* at col. 131 ll. 23–25; *id.* at col. 132 ll. 31–34. The specification equates a “Z0DH” filter with a type of interpolation filter. *Id.* at col. 160, ll. 19–21 (“This energy is directly used to drive the energy storage element of Z0DH filter or other interpolation filter . . . .”). The specification also states, “The Z0DH is a type of lowpass filter or sample interpolator

which provides a memory in between acquisitions.” *Id.* at col. 164 ll. 25–26. “Each acquisition,” according to the specification, “becomes an accumulated initial condition for the next acquisition.” *Id.* at col. 164 ll. 27–28. Likewise, in connection with a discussion of the matched filter embodiments of the invention, the specification teaches:

In addition, the matched filter operation of embodiments of the present invention is applied recursively to the bandpass signal at a rate sub-harmonically related to the carrier frequency. Each matched filtered result or correlation of embodiments of the present invention is retained and accumulated to provide an initial condition for subsequent recursions of the correlator. This accumulation is approximated as a zero order data hold filter.

*Id.* at col. 135 ll. 4–11.

The Court understands the '845 Patent to teach that once the sampled input signal is down-converted, the output is passed through a filter that converts the discrete samples to a continuous signal. The method taught by the specification does this by “accumulating” the prior sample for use as the starting point for the next sample. The Court understands this to mean that the continuous signal is generated from samples in a step-like fashion. That is to say, the interpolation filter takes a measurement of a sample and holds that value until the next sample is presented to it to measure. The output from such a filter would be a step-like approximation of the “true” down-converted continuous signal.

In this regard, neither definition offered by the parties sufficiently conveys what is meant by “interpolation filter.” On the one hand, the filter does “add additional values between sampled values,” as proposed by Qualcomm. However, this definition obscures what the filter is doing and is confusing in that way. ParkerVision is closer when it describes the filter as “circuitry that outputs a smoothed signal between the input sampled values,” but “smoothed” is not quite right, either. An “interpolation filter”

creates an approximation of the signal; “smoothed” evokes the sense of a close approximation than may necessarily occur for some embodiments of the invention, like those using a ZODH or similar interpolation filter.

Rather, it seems to the Court that the simplest, most encompassing, and most correct definition of interpolation was presented in the *Signals & Systems* textbook. (Doc. No. 120–2, p. 522.) That reference states, in a section titled “Reconstruction of a Signal From Its Samples Using Interpolation,” as follows:

Interpolation, that is, the fitting of a continuous signal to a set of sample values, is a commonly used procedure for reconstructing a function, either approximately or exactly, from samples. One simple interpolation procedure is the zero-order hold discussed in Section 7.1.

*Id.*<sup>11</sup>

Accordingly, the Court declines to adopt either proffered definition of the term “interpolation filter.” Instead that term shall be construed as “circuitry used to reconstruct a continuous signal, either approximately or exactly, from a set of samples.”

#### 11. “Asynchronous Energy Transfer Signal”

The term “asynchronous energy transfer signal” appears in claims 20 and 32 of the ’551 Patent and claim 31 of the ’371 Patent. The parties’ proposed definitions are:

<b>ParkerVision</b>	<b>Qualcomm</b>
“an energy transfer signal with a phase that varies with respect to the phase of the carrier signal”	indefinite or “nonsynchronous energy transfer signal”

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<sup>11</sup> Section 7.1 of this reference, which is also of record, describes how the output of a zero order hold operation “in essence represents a possible, although admittedly very coarse, interpolation between the sample values.” (Doc. No. 120–2, p. 522.)

Qualcomm argues that the term “asynchronous energy transfer signal” is indefinite because the term “asynchronous” is used “without defining a proper frame of reference—i.e., the signal to which it is asynchronous.” (Doc. No. 119, pp. 22–23.) ParkerVision argues that this term is not indefinite because “asynchronous” is a common term in the art with a well-known meaning. (Doc. No. 136, pp. 16–17.)

The term “asynchronous energy transfer signal” is not indefinite. The specifications as a whole teach the down-conversion of carrier signals and the transfer of energy from such signals. The specifications identify embodiments in which a switch-and-storage device is used to transfer the energy of a signal, in a manner resulting in the down-conversion of the signal to an intermediate signal. See '551 Patent col. 98 ll. 4–24. Thus, the “relative” nature of the term “asynchronous” is clear in the context of the disclosure—the energy-transfer signal is asynchronous vis-à-vis the carrier signal. See *Exxon Research & Eng'g Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001). Accordingly, Qualcomm’s indefiniteness argument is without merit.

As for the construction of this term, Qualcomm’s proposed claim construction amounts to replacing “asynchronous” with its synonym. Qualcomm does not offer any intrinsic or extrinsic evidence in support of this construction. ParkerVision, on the other hand, offers in support of its proposed construction an expert’s opinion that “asynchronous” is well-known term of art. In view of the teachings of the specification noted above and the proffered expert opinion, the Court determines that “asynchronous energy transfer signal” shall be construed to mean “an energy transfer signal with a phase that varies with respect to the phase of the carrier signal.”

## 12. “Universal Frequency Down Converter”

The term “universal frequency down converter” appears in claim 1 of the ’371 Patent. ParkerVision and Qualcomm offer the following meanings:

<u>ParkerVision</u>	<u>Qualcomm</u>
“circuitry that generates a down converted output signal from an input signal”	“circuitry with a switch, an integrator coupled to said switch, and a pulse generator coupled to said switch”

ParkerVision and Qualcomm agree that the inventors coined the term “universal frequency down converter.” ParkerVision argues that a universal frequency down converter is a type of universal frequency translation module that is configured to down-convert an signal. (Doc. No. 122, pp. 16–17.) Qualcomm contends that the term should be defined in purely structural terms and proposes a definition based on the language of the claim term. (Doc. No. 137, p. 15.)

The ’371 Patent teaches that a universal frequency translation module “operates to generate an output signal from an input signal, where the frequency of the output signal differs from the frequency of the input signal.” ’371 Patent col. 4 ll. 41–43. It also teaches that a universal frequency module can be configured as a universal frequency down-conversion module. *Id.* at col. 4 ll. 65–67. It then goes on to teach in detail how a universal frequency translation module can be used to down-convert a signal. *Id.* cols.5–9. The specification does not limit the implementation of a universal frequency down-conversion module to the configuration present in Qualcomm’s proposed definition.

Accordingly, the Court declines to adopt Qualcomm’s claim construction. The Court concludes that the term “universal frequency down converter” should be

construed as “circuitry that generates a down converted output signal from an input signal.”

### 13. “Generating a Lower Frequency Signal” and Similar Terms

In the claims identified in the table below, the patents-in-suit contain limitations relating to “generating a lower frequency signal.” The parties dispute the meaning of these terms as follows:

<u>Term</u>	<u>Claims</u>	<u>ParkerVision</u>	<u>Qualcomm</u>
“generating a lower frequency signal from the transferred energy”	1, 2, 3, 8, 9, 12, 16, 20, 39, 41, 50, 54, 55, 57, 92, 93, 108, 113, and 126 of the '551 Patent	no construction necessary	“creating a lower frequency signal from the previously transferred energy”
“lower frequency signal is generated from the transferred energy”	23, 24, 25, 26, 31, 32, 135, 149, 150, 161, 192, 193, 195, 196, 198, 202, and 203 of the '551 Patent; and 1, 2, 22, 23, 25, and 31 of the '371 Patent		
“generating the lower frequency signal from the integrated energy”	50 of the '551 Patent		terms are indefinite, or “creating a lower frequency signal from the previously integrated energy”



<b>Term</b>	<b>Claims</b>	<b>ParkerVision</b>	<b>Qualcomm</b>
“generates a lower frequency signal from the integrated energy”	202 of the '551 Patent		
“generating the baseband signal from the integrated energy”	1, 2, 3, 12, 17, 24, 27, and 82 of the '518 Patent		term is indefinite, or “creating a baseband signal from the previously integrated energy”
“generating the second signal from the integrated energy”	77, 81, 90, and 91 of the '518 Patent		term is indefinite, or “creating a second signal from the previously integrated energy”

The nub of the dispute regarding these terms is that Qualcomm prefers a claim construction that makes clear that there is a distinct temporal relationship between the transfer of energy as disclosed in the patents and the use of that energy to generate (or create) a down-converted signal.<sup>12</sup> Qualcomm’s proposed claim constructions would explicitly inform the jury that the devices and methods of the disclosed invention perform an energy transfer step prior to performing the following step of generating a signal.

This argument is not persuasive for two reasons. First, the Court does not understand the disclosed inventions to require the completion of an “energy transfer step” before the generation of a down-converted signal begins. The disclosed inventions

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<sup>12</sup> The Court understands Qualcomm’s indefiniteness objections to these terms to be related to the use of the “integrated energy” language. The Court rejects Qualcomm’s contentions for the reasons discussed *supra* in section 5.

could, for instance, integrate energy while simultaneously generating a down-converted signal. Qualcomm's proposed claim construction, which implies that these steps have precise start and end points, would likely confuse a jury.

Second, because the specifications and claims do not explicitly recite that each step must occur in the order listed in the claims, Qualcomm's proposed construction is the similar to arguing that the claimed steps implicitly require that they be performed in a certain order. There is some case law in support of this proposition, see *Loral Fairchild Corp. v. Sony Corp.*, 181 F.3d 1313, 1322 (Fed. Cir. 1999), but ordinarily, unless "the steps of a method actually recite an order, the steps are not ordinarily construed to require one," *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1342–43 (Fed. Cir. 2001). The claims here do not clearly denote a temporal relationship. Rather, one could understand the claim language identified by Qualcomm as referring to the fact that transferred energy is the source of the energy used to generate the down-converted signal.

Accordingly, the Court declines to adopt Qualcomm's proposed construction of the "generating a lower frequency signal" terms. The Court also finds that no construction of these terms is necessary in view of the terms' use of plain and direct language.

**14. "Controlling a Charging and Discharging Cycle of the First and Second Capacitors with First and Second Switching Devices, Respectively"**

This claim term is found in claims 18, 19, 20, 21, 22, and 23 of the '342 Patent.

ParkerVision and Qualcomm offer the following claim construction:

<b>ParkerVision</b>	<b>Qualcomm</b>
no construction necessary; or “using a first switch device to control the charging and discharging of a first capacitor and a second switch device to control the charging and discharging of a second capacitor”	“using the switching devices to control separately the time during which the charging of the capacitors occurs and the time during which the discharging of the capacitors occurs”

ParkerVision contends that this term, which is an entire step of several method claims, is not eligible for construction. (Doc. No. 122, pp. 8–9.) Qualcomm argues in response that it is appropriate to construe an entire step of a method where, as here, one cannot understand its subparts in isolation. (Doc. No. 137, pp. 7–8.) Qualcomm argues further that its construction is more appropriate because the specifications teach that the switching devices must control separately the charging and discharging cycles of the capacitors. (Doc. No. 119, pp. 21–22.) In response, ParkerVision contends that inserting the word “separately” into the proposed claim construction adds ambiguity and fails to impart Qualcomm’s understanding of the scope of the claim. (Doc. No. 19–20.)

The Court declines to construe this term. The Court is not persuaded that it is proper to construe an entire step of a method claim. Qualcomm does not contend that a particular subpart of the step cannot be understood. Instead, it argues that the switching devices control separately the charging and discharging cycles of the capacitors. This argument seems, to the Court, to be the same as reading a limitation (that is, the word “separately”) into the language of the claim. A court construing claim terms may not limit the scope of those terms based on the disclosure of a preferred embodiment. *Acumed LLC v. Stryker Corp.*, 483 F.3d 800, 807 (Fed. Cir. 2007); *see also TI Grp. Auto. Sys. (N. Am.), Inc., v. VDO N. Am., L.L.C.*, 375 F.3d 1126, 1136 (Fed. Cir. 2004). Rather, “a

patentee is entitled to a definition that encompasses all consistent meanings” of the term. *TI Grp.*, 375 F.3d at 1136.

The Court also agrees with ParkerVision that Qualcomm’s use of the word “separately” is ambiguous, confusing, and may not convey the meaning that Qualcomm intends. The Court agrees with ParkerVision that the language used in the claim is concise and straightforward. Further explanations are unnecessary and unwarranted. Therefore, the Court declines to construe this claim limitation.

**15. “Means for Operating Said UFD to Perform at Least Frequency Translation Operations . . . .”**

The parties agree that the function of this means-plus-function element from claim 1 of the ’371 Patent is “operating said UFD to perform at least frequency translation operations for at least one of (a)–(l).” (Doc. No. 141, p. 8; see *also* Doc. No. 119, p. 23.) The parties dispute whether a corresponding structure was clearly linked to this function in the ’371 Patent’s disclosure.

ParkerVision contends that the patent teaches the use of a control signal to operate the component of the universal frequency down-conversion module (“UFD”). (Doc. No. 122, p. 24.) Qualcomm argues that this is not correct because the operating means must be capable of working on “said UFD,” that is, “a switch, an integrator coupled to said switch, and a pulse generator coupled to said switch.” (Doc. No. 137, pp. 19–20.) Qualcomm reasons that the control signal proposed by ParkerVision as the structure for this claim element cannot serve as an operating means because it is generated by a pulse generator, which is a component of a UFD. (*Id.*) Further, Qualcomm argues that the ’371 Patent fails to disclose a structure because the

specification does not disclose an algorithm for use with a general purpose microprocessor. (Doc. No. 119, p. 24.)

A means-plus-function claim limitation is limited to the structures disclosed in the specification and equivalents. *Mettler-Toledo, Inc. v. B-Tek Scales, LLC*, 671 F.3d 1291, 1296 (Fed. Cir. 2012). This Court must look to the specification to determine which structures correspond to the claimed function. *Id.* The structure “disclosed in the specification is a ‘corresponding’ structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *Id.* (quoting *B. Braun Med. Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997)). A disclosure is sufficient if it permits one of ordinary skill in the art to know and understand what structure corresponds to the means-plus-function limitation so that he may perceive the bounds of the invention. *In re Aoyama*, 656 F.3d 1293, 1298 (Fed. Cir. 2011). Further, if a patentee chooses to disclose a single embodiment, then any means-plus-function claim limitation will be limited to the single disclosed structure and equivalents thereof. *Mettler-Toledo*, 671 F.3d at 1296.

The Court does not find Qualcomm’s arguments persuasive. The ’371 Patent links a control signal to the operation of a UFD and UFT, and it teaches that a UFT is a component of a UFD. The ’371 Patent further teaches that a control signal consists of a train of pulses generated by a pulse generator. This is sufficient for one skilled in the art to appreciate what structure corresponds to this means-plus-function claim limitation.

With regard to Qualcomm’s second argument, the case law relied on by Qualcomm is applicable only “where the disclosed structure is a computer programmed to implement an algorithm.” *Aoyama*, 656 F.3d at 97. Qualcomm does not point to any language disclosing a general-purpose as the structure corresponding to this means-

plus-function claim limitation. As such, Qualcomm has not shown that the general-purpose computer line of cases is applicable.

Accordingly, the Court construes “means for operating said UFD to perform at least frequency translation operations” as follows. The function of this limitation is “operating said UFD to perform at least frequency translation operations for at least one of (a)–(l).” The corresponding structure is “a control signal of the UFD disclosed as signal 108 of Figures 1A–1C, 2006 of Figures 20A and 20A-1, or equivalents thereof.”

**16. “Means for Integrating the Energy over the Aperture Periods” and “Means for Integrating the Transferred Energy over the Aperture Periods”**

The parties agree as to the function of these means-plus-function claim limitations, which appear in claims 82, 90, and 91 of the ’518 Patent.<sup>13</sup> (Doc. No. 141, p. 8; *see also* Doc. No. 119, p. 23.) The parties disagree as to which structures correspond to the functions of these limitations. ParkerVision contends that its proposed construction identifies “all corresponding structure that actually performs the recited functions and includes no extraneous structure.” (Doc. No. 122, p. 21.) Qualcomm, on the other hand, contends that ParkerVision’s proposal is wrong in that the specification does not clearly link the disclosure found in Figure 68F with the function of these claim limitations. (Doc. No. 137, pp. 18–19.)

The parties appear to agree that the specification of the ’518 Patent links a capacitive storage device to the prescribed functions. The specification specifically describes a number of ways in which such devices may be implemented. ’518 Patent col. 99 l. 35–col. 100 l. 9. The specification also specifically refers to the embodiment

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<sup>13</sup> The Court understands Qualcomm’s indefiniteness objections to these terms to be related to the use of the “integrated energy” language. The Court rejects Qualcomm’s contentions for the reasons discussed *supra* in section 5.

described in Figure 68F as an “illustration” of a capacitive storage unit. *Id.* at col. 99 ll. 59–64. For these reasons, the Court finds ParkerVision’s arguments more persuasive.

Accordingly, the Court construes these terms as follows. The function associated with the means-plus-function limitation “means for integrating the energy over the aperture periods” is “integrating the energy over the aperture periods.” The structure that corresponds to that function is “one or more of energy storage circuitry disclosed in Figures 68C, 68F, or equivalents thereof.” The function associated with “means for integrating the transferred energy over the aperture periods” is “integrating the transferred energy over the aperture periods.” The structure that corresponds to that function is “one or more of energy storage circuitry disclosed in Figures 68C, 68F, or equivalents thereof.”

**17. “Means for Generating the Baseband Signal from the Integrated Energy” and “Means for Generating the Second Signal from the Integrated Energy”**

The parties agree as to the functions of these two means-plus-function claim limitations, which appear in claims 82, 90, and 91 of the ’518 Patent.<sup>14</sup> (Doc. No. 141, p. 8; see *also* Doc. No. 119, p. 23.) As above, the parties disagree as to which structures correspond to these functions. ParkerVision contends that the corresponding structure is a number of disclosed arrangements consisting of switch circuitry controlled by pulse generators and capacitors. (Doc. No. 122, p. 23.) Qualcomm argues that ParkerVision’s corresponding structure is incorrect because the functions of these limitations relate to

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<sup>14</sup> The Court understands Qualcomm’s indefiniteness objections to these terms to be related to the use of the “integrated energy” language. The Court rejects Qualcomm’s contentions for the reasons discussed *supra* in section 5.

the accumulation of energy from several aperture periods, whereas the structures identified by ParkerVision are not linked to the claimed functions. (Doc. No. 137, p. 19.)

This dispute is related to the parties' disagreements regarding the "integrating energy" terms and the "accumulating the result" term. Qualcomm's arguments distinguish between energy that accumulates over aperture periods and energy that accumulates during an aperture period. Because the Court has rejected Qualcomm's attempts to limit the scope of the previous terms in that fashion, the Court also rejects its attempt to limit the scope of these terms.

Accordingly, the Court adopts ParkerVision's proposed claim construction for these terms. The function associated with the means-plus-function limitation "means for generating the baseband signal from the integrated energy" is "generating the baseband signal from the integrated energy." The structure that corresponds to that function is "any arrangement of (i) one or more of the switch circuitry controlled by any one of pulse generators and (ii) one or more of the energy storage circuitry disclosed or described in Figures 63, 64A, 64B, 65, 67A, 68G, 69, 74, 76A–E, 77A–C, 82A, 82B, 86, 88, 90, 92, 94A, 95, 101, 110, 111, or equivalents thereof." The function associated with "means for generating the second signal from the integrated energy" is "generating the second signal from the integrating energy." The structure that corresponds to that function is "any arrangement of (i) one or more of the switch circuitry controlled by any one of pulse generators and (ii) one or more of the energy storage circuitry disclosed or described in Figures 63, 64A, 64B, 65, 67A, 68G, 69, 74, 76A–E, 77A–C, 82A, 82B, 86, 88, 90, 92, 94A, 95, 101, 110, 111, or equivalents thereof."



\* \* \* \* \*

Qualcomm also raises two indefiniteness issues. (Doc. No. 119, p. 25.) The first is related to certain “words of degree” that are used in “the claims of the ’551 Patent and ’518 Patent in which they appear.” (*Id.*) The second relates to the use of what Qualcomm contends are undefined mathematical terms that appear in claim 4 of the ’845 Patent. (*Id.*)

The Court declines to address Qualcomm’s arguments at this time. First, Qualcomm does not ask the Court to construe terms related to these issues; rather, Qualcomm seeks an adjudication of one of its affirmative defenses. Such a request should be made in the form of a dispositive motion, where it can put the opposing party on notice of the potential adjudication of claims and can be briefed in a comprehensive fashion. *Cf. Milburn v. United States*, 734 F.2d 762, 765–66 (11th Cir. 1984) (holding that district courts should not convert pretrial motions to a motion for summary judgment under Federal Rule of Civil Procedure 56 where the opposing party has not been notified of the potential adjudication of claims).

Second, Qualcomm’s argument relating to “words of degree” is not well-defined. There are 204 claims in the ’551 Patent and 99 claims in the ’518 Patent. This Court is not inclined to rule on a potentially dispositive issue where its proponent has not specifically identified all of the claims to which the argument applies. Nor is it possible for the Court to scour 303 patent claims on its own so that it can fully appreciate the scope of the relief requested.

Qualcomm may raise these issues again on summary judgment, if it so chooses.

### CONCLUSION

The Court therefore construes the disputed claim terms as set forth above. **IT IS SO ORDERED.**

**DONE AND ORDERED** in Chambers in Jacksonville, Florida, on February 20, 2013.

  
\_\_\_\_\_  
ROY B. DALTON JR.  
United States District Judge

Copies:

Counsel of Record

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF FLORIDA  
JACKSONVILLE DIVISION**

PARKERVISION, INC.,

Plaintiff,

v.

Case No. 3:11-cv-719-J-37-RBD-TEM

QUALCOMM INCORPORATED,

Defendant.

**VERDICT FORM**

In answering these questions, you are to follow all of the instructions I have given you in the Court's Charge. Do you, the jury, find the following:

**FINDINGS ON INFRINGEMENT**

1. Has ParkerVision proven by a preponderance of the evidence that any of Qualcomm's Accused Products infringe any of the following claims of the following patents?

Please answer "Yes" or "No" for each claim.

<b>U.S. Patent No. 6,061,551</b>	
Claim 23	YES
Claim 25	YES
Claim 161	YES
Claim 193	YES
Claim 202	YES
<b>U.S. Patent No. 6,266,518</b>	

Claim 27	YES
Claim 82	YES
Claim 90	YES
Claim 91	YES
<b>U.S. Patent No. 6,370,371</b>	
Claim 2	YES
<b>U.S. Patent No. 7,496,342</b>	
Claim 18	YES

2. If you answered yes to any part of Question 1, please place a checkmark next to those Accused Products that you find to infringe.

Astra	✓
Bahama	✓
Eagleray	✓
GZIF3	✓
GZIF4	✓
Halley	✓
Hercules	✓
Iceman	✓
Iris	✓
Libra/Gemini	✓
Magellan	✓
Marimba	✓
Merlin	✓
Napoleon	✓
Odyssey	✓
Ramsis	✓

Solo	✓
Volans	✓
Voltron	✓
Ywing	✓

### FINDINGS ON INVALIDITY

3. For each claim, has Qualcomm proven by clear and convincing evidence that the claim is anticipated?

Please answer "Yes" or "No" for each claim.


<b>U.S. Patent No. 6,061,551</b>	
Claim 23	NO
Claim 25	NO
Claim 161	NO
Claim 193	NO
Claim 202	NO
<b>U.S. Patent No. 6,266,518</b>	
Claim 27	NO
Claim 82	NO
Claim 90	NO
Claim 91	NO
<b>U.S. Patent No. 6,370,371</b>	
Claim 2	NO
<b>U.S. Patent No. 7,496,342</b>	

Claim 18	NO

You are finished. The Jury Foreperson should sign on the space provided at the end of this charge and then alert the Court Security Officer that you have reached a verdict.

The foregoing is the unanimous verdict of the jury.

DATED: October 17, 2013.

  
\_\_\_\_\_  
Signature of Jury Foreperson

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF FLORIDA  
JACKSONVILLE DIVISION**

PARKERVISION, INC.,

Plaintiff,

v.

Case No. 3:11-cv-719-J-37-RBD-TEM

QUALCOMM INCORPORATED,

Defendant.

**VERDICT FORM**

In answering these questions, you are to follow all of the instructions I have given you in the Court's Charge. Do you, the jury, find the following:

1. What sum of money, if any, do you find from a preponderance of the evidence is adequate to compensate ParkerVision for Qualcomm's conduct that you found infringing? Provide the amount, if any, in dollars and cents in the appropriate categories below.

1. Direct Infringement	2. Inducement	3. Total = 1+2
\$795,874.00	\$171,908,726.00	\$172,704,600.00

2. Has ParkerVision proven by clear and convincing evidence that Qualcomm's infringement of the asserted claims was willful?

Please answer "Yes" or "No for Each Patent.

U.S. Patent No. 6,061,551	NO
U.S. Patent No. 6,266,518	NO

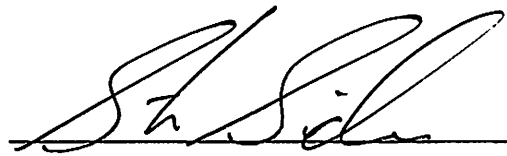
U.S. Patent No. 6,370,371	NO
U.S. Patent No. 7,496,342	NO

You are finished. The Jury Foreperson should sign on the space provided at the end of this charge and then alert the Court Security Officer that you have reached a verdict.



The following is the unanimous verdict of the jury.

DATED: October 24, 2013.

A handwritten signature in black ink, appearing to be "S. H. Silva", written over a horizontal line.

Signature of Jury Foreperson

**CERTIFICATE OF SERVICE**

I certify that on September 15, 2014, this CORRECTED NONCONFIDENTIAL BRIEF OF PLAINTIFF-APPELLANT PARKERVISION, INC. was filed electronically using the CM/ECF system and served via the CM/ECF system on counsel for Defendant-Cross Appellant as follows:

Timothy S. Teter  
Cooley, LLP  
3175 Hanover Street  
Palo Alto, CA 94304-1130  
[teterts@colley.com](mailto:teterts@colley.com)

/s/ Kay Wylie

**CERTIFICATE OF COMPLIANCE**

I certify that this CORRECTED BRIEF OF PLAINTIFF-APPELLANT PARKERVISION, INC. contains 13,402 words as measured by the word processing software used to prepare this brief.

/s/ *Jacob A. Schroeder*